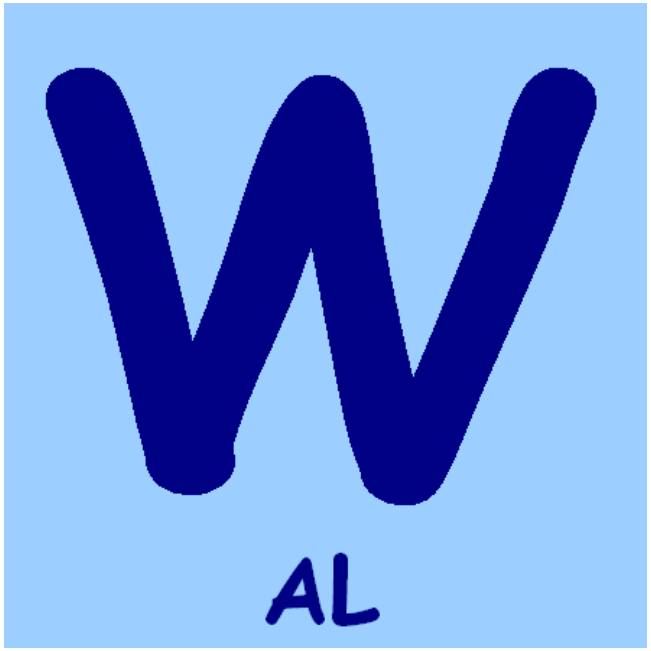
WorkBook

Solutions



Complete Solutions V1.03
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Solutions sheet No. 1	Planar Shapes						
	Answer		**Answer**		**Answer**		**Answer**
1	Rectangle	**6**	Circle	**11**	Hexagon	**16**	Acute angled triangle
2	Scalene triangle	**7**	Square	**12**	Square	**17**	Ellipse
3	Octagon	**8**	Equilateral triangle	**13**	Pentagon	**18**	Kite
4	Right angled triangle	**9**	Parallelogram	**14**	Quadrilateral	**19**	Isosceles triangle
5	Rhombus	**10**	Obtuse angled triangle	**15**	Trapezium	**20**	Rhombus

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Solutions sheet No. 2	Naming Solids						
	Answer		**Answer**		**Answer**		**Answer**
1	Cube	**6**	Pentagonal prism	**11**	Cone	**16**	Octagonal prism
2	Rectangular prism	**7**	Cylinder	**12**	Hexagonal prism	**17**	Rectangular prism
3	Square pyramid	**8**	Rectangular prism	**13**	Cylinder	**18**	Cone
4	Cylinder	**9**	Square prism	**14**	Triangular prism	**19**	Rectangular prism
5	Triangular prism	**10**	Triangular prism	**15**	Trapezoidal prism	**20**	Triangular prism

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Solutions sheet No. 3	Axes of Symmetry						
	Answer		**Answer**		**Answer**		**Answer**
1	One (1)	**6**	Four (4)	**11**	Six (6)	**16**	Two (2)
2	One (1)	**7**	Two (2)	**12**	Four (4)	**17**	Infinite (∞)
3	One (1)	**8**	Three (3)	**13**	Five (5)	**18**	Four (4)
4	Nil (0)	**9**	One (1)	**14**	Eight (8)	**19**	One (1)
5	Two (2)	**10**	One (1)	**15**	One (1)	**20**	Two (2)

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Solutions sheet No. 4	Naming Angles						
	Answer		**Answer**		**Answer**		**Answer**
1	$\angle ABC$ or $\angle CBA$	**6**	$\angle BED$ or $\angle DEB$	**11**	$\angle ACB$ or $\angle BCA$	**16**	$\angle QRS$ or $\angle SRQ$
2	$\angle WXY$ or $\angle YXW$	**7**	$\angle QRT$ or $\angle TRQ$	**12**	$\angle BCD$ or $\angle DCB$	**17**	$\angle CDE$ or $\angle EDC$
3	$\angle LMN$ or $\angle NML$	**8**	$\angle KPV$ or $\angle VPK$	**13**	$\angle WZY$ or $\angle YZW$	**18**	$\angle LPN$ or $\angle NPL$
4	$\angle POR$ or $\angle ROP$	**9**	$\angle LNM$ or $\angle MNL$	**14**	$\angle EDG$ or $\angle GDE$	**19**	$\angle ADE$ or $\angle EDA$
5	$\angle SVT$ or $\angle TVS$	**10**	$\angle CBD$ or $\angle DBC$	**15**	$\angle JHL$ or $\angle LHJ$	**20**	$\angle CAY$ or $\angle YAC$

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Solutions sheet No. 5	Geometrical Properties 1						
	Answer		**Answer**		**Answer**		**Answer**
1	Line *AB*	**6**	Acute angle *ABC*	**11**	Isosceles triangle *LMN*	**16**	Square *KLMN*
2	Line *XY*	**7**	Obtuse angle *POR*	**12**	Right triangle *PQR*	**17**	Trapezium *EFGH*
3	Ray *AB*	**8**	Acute angle *WXY*	**13**	Quadrilateral *ABCD*	**18**	Hexagon *ABCDEF*
4	Interval *AB*	**9**	Right angle *AEF*	**14**	Rectangle *TUVW*	**19**	Reflex angle *VUY*
5	Interval *XY*	**10**	Triangle *ABC*	**15**	Parallelogram *DEFG*	**20**	Angle of revolution *A*

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Solutions sheet No. 6	Types of Angles						
	Answer		**Answer**		**Answer**		**Answer**
1	Acute angle	**6**	Angle of revolution	**11**	Acute angle	**16**	Acute angle
2	Right angle	**7**	Obtuse angle	**12**	Reflex angle	**17**	Right angle
3	Obtuse angle	**8**	Acute angle	**13**	Straight angle	**18**	Reflex angle
4	Straight angle	**9**	Obtuse angle	**14**	Obtuse angle	**19**	Obtuse angle
5	Reflex angle	**10**	Acute angle	**15**	Straight angle	**20**	Reflex angle

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Solutions sheet No. 7		Measuring Angles (Acute) Answers may vary depending on your printer.					
	Answer		**Answer**		**Answer**		**Answer**
1		**6**		**11**		**16**	
2		**7**		**12**		**17**	
3		**8**		**13**		**18**	
4		**9**		**14**		**19**	
5		**10**		**15**		**20**	

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Solutions sheet No. 8		Measuring Intervals 1 (Centimetres) * Requires rounding of answer					
	Answer		**Answer**		**Answer**		**Answer**
1	10 cm	**6**	12 cm	**11**	5 cm	**16**	10 cm *
2	9 cm	**7**	2 cm	**12**	9 cm	**17**	10 cm *
3	14 cm	**8**	15 cm	**13**	11 cm	**18**	13 cm *
4	3 cm	**9**	7 cm	**14**	8 cm	**19**	6 cm *
5	6 cm	**10**	13 cm	**15**	5 cm	**20**	9 cm *

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Solutions sheet No. 9		Measuring Intervals 1 (Millimetres) Answers may vary depending on your printer.					
	Answer		**Answer**		**Answer**		**Answer**
1	100 mm	**6**	32 mm	**11**	115 mm	**16**	45 mm
2	98 mm	**7**	102 mm	**12**	139 mm	**17**	98 mm
3	83 mm	**8**	105 mm	**13**	81 mm	**18**	49 mm
4	126 mm	**9**	67 mm	**14**	108 mm	**19**	96 mm
5	76 mm	**10**	63 mm	**15**	45 mm	**20**	134 mm

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Solutions sheet No. 10	Time 1	
	Answer	
	Digital	Words
1	3:00	Three o’clock
2	8:00	Eight o’clock
3	4:30	Half past four
4	10:30	Half past ten
5	6:00	Six o’clock
6	8:30	Half past eight
7	5:15	Quarter past five
8	10:15	Quarter past ten
9	5:45	Quarter to six
10	12:45	Quarter to one
11	5:05	Five past five
12	7:20	Twenty past seven
13	10:10	Ten past ten
14	5:50	Ten to six
15	9:25	Twenty five past nine
16	11:40	Twenty to twelve
17	9:35	Twenty five to ten
18	11:20	Twenty past eleven
19	2:40	Twenty to three
20	2:55	Five to three

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Solutions sheet No. 11	Time 2		
	Answer		
	Digital	**24 Hour**	**Words**
1	4 am	0400	Four o'clock
2	7 am	0700	Seven o'clock
3	3:30 am	0330	Half past three
4	11:30 pm	2330	Half past eleven
5	(12) Midday	1200	Midday
6	9:30 am	0930	Half past nine
7	6:15 am	0615	Quarter past six
8	9:15 pm	2115	Quarter past nine
9	6:45 am	0645	Quarter to seven
10	1:45 pm	1345	Quarter to two
11	7:05 pm	1905	Five past seven
12	6:20 am	0620	Twenty past six
13	11:10 pm	2310	Ten past eleven
14	3:50 pm	1550	Ten to four
15	8:25 pm	2025	Twenty five past eight
16	10:40 pm	2240	Twenty to eleven
17	12:35 am	0035	Twenty five to one
18	8:20 am	0820	Twenty past eight
19	1:40 pm	1340	Twenty to two
20	8:55 pm	2055	Five to nine

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Solutions sheet No. 12		Perimeter 1					
	Answer		**Answer**		**Answer**		**Answer**
1	43 cm	**6**	100 mm	**11**	190 cm	**16**	84 m
2	44 m	**7**	44 cm	**12**	58 m	**17**	94 mm
3	58 cm	**8**	60 cm	**13**	77 mm	**18**	78 cm
4	77 cm	**9**	62 cm	**14**	144 m	**19**	90 mm
5	80 cm	**10**	240 m	**15**	275 cm	**20**	200 m

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Solutions sheet No. 13		Perimeter 2					
	Answer		**Answer**		**Answer**		**Answer**
1	40 cm	**6**	80 mm	**11**	154 mm	**16**	68 cm
2	90 cm	**7**	96 m	**12**	250 cm	**17**	72 cm
3	46 cm	**8**	54 cm	**13**	112 cm	**18**	85 cm
4	60 cm	**9**	55 cm	**14**	80 cm	**19**	410 m
5	45 cm	**10**	96 cm	**15**	220 m	**20**	320 m

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Solutions sheet No. 14		Perimeter – Composite Shapes 1					
	Answer		**Answer**		**Answer**		**Answer**
1	66 cm	**6**	208 mm	**11**	120 cm	**16**	112 m
2	170 cm	**7**	56 m	**12**	188 cm	**17**	318 cm
3	84 cm	**8**	340 cm	**13**	280 mm	**18**	102 m
4	150 m	**9**	194 m	**14**	424 cm	**19**	258 cm
5	240 cm	**10**	164 cm	**15**	500 cm	**20**	320 cm

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Solutions sheet No. 15	Area of Rectangles, Squares and Parallelograms						
	Answer		**Answer**		**Answer**		**Answer**
1	80 cm^2	**6**	64 cm^2	**11**	20 cm^2	**16**	70 cm^2
2	600 cm^2	**7**	400 m^2	**12**	600 cm^2	**17**	4800 cm^2
3	1500 cm^2	**8**	2500 m^2	**13**	140 m^2	**18**	1600 m^2
4	9600 m^2	**9**	256 cm^2	**14**	500 cm^2	**19**	750 m^2
5	320 cm^2	**10**	40000 m^2	**15**	1000 cm^2	**20**	6300 cm^2

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Solutions sheet No. 16	Area of Triangles						
	Answer		**Answer**		**Answer**		**Answer**
1	20 cm^2	**6**	10 cm^2	**11**	21 cm^2	**16**	180 cm^2
2	60 cm^2	**7**	150 cm^2	**12**	45 cm^2	**17**	250 cm^2
3	150 cm^2	**8**	160 cm^2	**13**	20 cm^2	**18**	27 cm^2
4	250 cm^2	**9**	360 cm^2	**14**	150 cm^2	**19**	170 cm^2
5	140 cm^2	**10**	1000 cm^2	**15**	90 cm^2	**20**	45 cm^2

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Solutions sheet No. 17	Area of Composite Shapes 1						
	Answer		**Answer**		**Answer**		**Answer**
1	260 cm^2	**6**	3200 cm^2	**11**	2700 cm^2	**16**	346 m^2
2	1380 cm^2	**7**	204 m^2	**12**	1300 cm^2	**17**	45.51 cm^2
3	365 cm^2	**8**	2025 cm^2	**13**	172 cm^2	**18**	51 m^2
4	1425 cm^2	**9**	1350 m^2	**14**	3307 cm^2	**19**	336 cm^2
5	1625 cm^2	**10**	63.7 cm^2	**15**	9200 cm^2	**20**	7500 cm^2

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Solutions sheet No. 18	Area of Composite Shapes 2 (Shaded)						
	Answer		**Answer**		**Answer**		**Answer**
1	170 cm²	**6**	102 cm²	**11**	733.5 cm²	**16**	316 cm²
2	1080 cm²	**7**	264 m²	**12**	430 cm²	**17**	12.5 m²
3	200 cm²	**8**	56 cm²	**13**	450 m²	**18**	160 cm²
4	380 cm²	**9**	171 cm²	**14**	14.75 cm²	**19**	228 cm²
5	896 cm²	**10**	255 m²	**15**	7.92 m²	**20**	162 cm²

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Solutions sheet No. 19	Area of Trapeziums						
	Answer		**Answer**		**Answer**		**Answer**
1	270 cm²	**6**	1225 cm²	**11**	12190 mm²	**16**	1950 cm²
2	625 cm²	**7**	161 cm²	**12**	131.67 cm²	**17**	6.6 m²
3	700 cm²	**8**	1225 m²	**13**	15400 mm²	**18**	10.54 cm²
4	3900 cm²	**9**	4900 mm²	**14**	1.8 m²	**19**	2.6 m²
5	7500 m²	**10**	1360 m²	**15**	18000 m²	**20**	23.52 cm²

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Solutions sheet No. 20	Naming Circle Properties						
	Answer		**Answer**		**Answer**		**Answer**
1	Arc	**6**	Radius	**11**	Centre	**16**	Concentric circles
2	Diameter	**7**	Tangent	**12**	Circle (planar shape)	**17**	Annulus
3	Chord	**8**	Point of contact	**13**	Circle (set of equidistant points)	**18**	Cyclic quadrilateral
4	Minor segment	**9**	Secant	**14**	Semi-circle	**19**	In- circle
5	Major segment	**10**	Minor Sector	**15**	Major sector	**20**	Quadrant

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Solutions sheet No. 21	Circumference of Circles						
	Answer		**Answer**		**Answer**		**Answer**
1	62.8 cm	**6**	251.3 cm	**11**	62.8 cm	**16**	50.3 m
2	125.7 cm	**7**	219.9 cm	**12**	28.3 m	**17**	56.5 m
3	628.3 cm	**8**	263.9 m	**13**	251.3 cm	**18**	30.8 cm
4	31.4 m	**9**	15.7 cm	**14**	21.4 cm	**19**	20.1 m
5	75.4 cm	**10**	28.3 cm	**15**	1256.6 cm	**20**	32.7 m

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Solutions sheet No. 22	Area of Circles						
	Answer		**Answer**		**Answer**		**Answer**
1	314.2 cm^2	**6**	5026.5 cm^2	**11**	314.2 cm^2	**16**	201.1 m^2
2	1256.6 cm^2	**7**	3848.5 cm^2	**12**	63.6 m^2	**17**	254.5 m^2
3	31415.9 cm^2	**8**	5541.8 m^2	**13**	5026.5 cm^2	**18**	75.4 cm^2
4	78.5 m^2	**9**	19.6 cm^2	**14**	36.3 cm^2	**19**	32.2 m^2
5	452.4 cm^2	**10**	63.6 cm^2	**15**	125663.7 cm^2	**20**	84.9 m^2

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Solutions sheet No. 23	Perimeter – Composite Shapes 2						
	Answer		**Answer**		**Answer**		**Answer**
1		**6**		**11**		**16**	
2		**7**		**12**		**17**	
3		**8**		**13**		**18**	
4		**9**		**14**		**19**	
5		**10**		**15**		**20**	

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Solutions sheet No. 24	Area of Composite Shapes 3						
	Answer		**Answer**		**Answer**		**Answer**
1		**6**		**11**		**16**	
2		**7**		**12**		**17**	
3		**8**		**13**		**18**	
4		**9**		**14**		**19**	
5		**10**		**15**		**20**	

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Solutions sheet No. 25	Volume of Prisms 1						
	Answer		**Answer**		**Answer**		**Answer**
1	300 cm^3	**6**	1500 mm^3	**11**	1800 m^3	**16**	28.8 m^3
2	600 cm^3	**7**	600 cm^3	**12**	600 cm^3	**17**	2200 cm^3
3	150 cm^3	**8**	1000 cm^3	**13**	3 m^3	**18**	6600 cm^3
4	8000 cm^3	**9**	600 cm^3	**14**	1500 mm^3	**19**	27000 cm^3
5	600 cm^3	**10**	240 cm^3	**15**	480 m^3	**20**	50 m^3

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Solutions sheet No. 26	Volume of Prisms 2						
	Answer		**Answer**		**Answer**		**Answer**
1		**6**		**11**		**16**	
2		**7**		**12**		**17**	
3		**8**		**13**		**18**	
4		**9**		**14**		**19**	
5		**10**		**15**		**20**	

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Solutions sheet No. 27	Pythagoras' Theorem 1						
	Answer		**Answer**		**Answer**		**Answer**
1	a = 5 cm	**6**	f = 50 cm	**11**	m = 25 cm	**16**	s = 4.1 cm
2	b = 15 cm	**7**	g = 13 cm	**12**	n = 10 cm	**17**	t = 4.2 m
3	c = 25 cm	**8**	h = 17 cm	**13**	p = 26 cm	**18**	u = 5.8 cm
4	d = 32 cm	**9**	j = 18 cm	**14**	q = 30 m	**19**	v = 10 cm
5	e = 64 cm	**10**	k = 13 cm	**15**	r = 4.5 cm	**20**	w = 17 cm

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Solutions sheet No. 28	Pythagoras' Theorem 2						
	Answer		**Answer**		**Answer**		**Answer**
1	a = 4 cm	**6**	f = 8 cm	**11**	m = 24 cm	**16**	s = 6.9 cm
2	b = 5 cm	**7**	g = 9 cm	**12**	n = 9 cm	**17**	t = 20 m
3	c = 7 cm	**8**	h = 40 cm	**13**	p = 6 cm	**18**	u = 18 cm
4	d = 12 cm	**9**	j = 12 cm	**14**	q = 16 m	**19**	v = 1.6 cm
5	e = 27 cm	**10**	k = 3 cm	**15**	r = 7.9 cm	**20**	w = 40 cm

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Solutions sheet No. 29	Pythagoras' Theorem 3						
	Answer		**Answer**		**Answer**		**Answer**
1	a = 15 cm	**6**	f = 12.5 m	**11**	k = 6.6 cm	**16**	p = 10.4 cm
2	b = 15 cm	**7**	g = 5.7 cm	**12**	l = 10 cm	**17**	q = 15 m
3	c = 2.1 cm	**8**	h = 5.7 mm	**13**	m = 14 cm	**18**	r = 7 cm
4	d = 7.5 cm	**9**	i = 13.9 cm	**14**	n = 12 m	**19**	s = 1.8 cm
5	e = 20 cm	**10**	j = 34 cm	**15**	o = 7.9 cm	**20**	t = 5.7 m

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Solutions sheet No. 30		Perimeter Involving Pythagoras' Theorem					
	Answer		**Answer**		**Answer**		**Answer**
1	a = 24 cm	**6**	f = 50.8 m	**11**	k = 231.2 cm	**16**	p = 40 m
2	b = 50 cm	**7**	g = 151.2 cm	**12**	l = 186.8 m	**17**	q = 105.4 mm
3	c = 96 cm	**8**	h = 62 cm	**13**	m = 36 cm	**18**	r = 14.6 cm
4	d = 102 m	**9**	i = 26.3 m	**14**	n = 45.3 cm	**19**	s = 111.2 cm
5	e = 150 m	**10**	j = 76 cm	**15**	o = 274.2 cm	**20**	t = 20 m

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Solutions sheet No. 31	Measuring Angles (Obtuse)
	Answer
1	
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Solutions sheet No. 40	Vertically Opposite Angles	
	Answer	**Reason**
1	$a = 120°$	Vertically opposite angles are equal.
2	$b = 82°$	Vertically opposite angles are equal.
3	$c = 57°$	Vertically opposite angles are equal.
4	$d = 135°$	Vertically opposite angles are equal.
5	$e = 78°$	Vertically opposite angles are equal.
6	$f = 86°$	Vertically opposite angles are equal.
7	$g = 90°$	Vertically opposite angles are equal.
8	$h = 115°$	Vertically opposite angles are equal.
9	$j = 42°$	Vertically opposite angles are equal.
10	$k = 97°$	Vertically opposite angles are equal.
11	$m = 140°$	Vertically opposite angles are equal.
12	$n = 36°$	Vertically opposite angles are equal.
13	$p = 93°$	Vertically opposite angles are equal.
14	$q = 52°$	Vertically opposite angles are equal.
15	$r = 90°$	Vertically opposite angles are equal.
16	$s = 110°$	Vertically opposite angles are equal. (and angle sum of adjacent angles)
17	$t = 50°$	Vertically opposite angles are equal.
18	$u = 25°$	Vertically opposite angles are equal. (and angle sum of adjacent angles)
19	$v = 60°$	Vertically opposite angles are equal. (and angle sum of adjacent angles)
20	$w = 90°$	Vertically opposite angles are equal.

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Solutions sheet No. 41	Straight Angles 1	
	Answer	**Reason**
1	$a = 120$	Straight angles are supplementary (180°)
2	$b = 95$	Straight angles are supplementary (180°)
3	$c = 81$	Straight angles are supplementary (180°)
4	$d = 140$	Straight angles are supplementary (180°)
5	$e = 130$	Straight angles are supplementary (180°)
6	$f = 40$	Straight angles are supplementary (180°)
7	$g = 98$	Straight angles are supplementary (180°)
8	$h = 42$	Straight angles are supplementary (180°)
9	$i = 43$	Straight angles are supplementary (180°)
10	$j = 136$	Straight angles are supplementary (180°)
11	$k = 135$	Straight angles are supplementary (180°)
12	$l = 142$	Straight angles are supplementary (180°)
13	$m = 90$	Straight angles are supplementary (180°)
14	$n = 131$	Straight angles are supplementary (180°)
15	$p = 96$	Straight angles are supplementary (180°)
16	$q = 90$	Straight angles are supplementary (180°)
17	$r = 95$	Straight angles are supplementary (180°)
18	$s = 72$	Straight angles are supplementary (180°)
19	$t = 123$	Straight angles are supplementary (180°)
20	$u = 105$	Straight angles are supplementary (180°)

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Solutions sheet No. 42	Straight Angles 2	
	Answer	**Reason**
1	$a = 60$	Straight angles are supplementary (180°)
2	$b = 100$	Straight angles are supplementary (180°)
3	$c = 102$	Straight angles are supplementary (180°)
4	$d = 45$	Straight angles are supplementary (180°)
5	$e = 90$	Straight angles are supplementary (180°)
6	$f = 49$	Straight angles are supplementary (180°)
7	$g = 90$	Straight angles are supplementary (180°)
8	$h = 76$	Straight angles are supplementary (180°)
9	$k = 57$	Straight angles are supplementary (180°)
10	$m = 41$	Straight angles are supplementary (180°)
11	$n = 100$	Straight angles are supplementary (180°)
12	$p = 68$	Straight angles are supplementary (180°)
13	$q = 39$	Straight angles are supplementary (180°)
14	$r = 52$	Straight angles are supplementary (180°)
15	$s = 29$	Straight angles are supplementary (180°)
16	$t = 65$	Straight angles are supplementary (180°)
17	$u = 103$	Straight angles are supplementary (180°)
18	$v = 76$	Straight angles are supplementary (180°)
19	$w = 81$	Straight angles are supplementary (180°)
20	$x = 42$	Straight angles are supplementary (180°)

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Solutions sheet No. 43	Angle of Revolution	
	Answer	**Reason**
1	$a = 80$	An angle of revolution is 360°
2	$b = 145$	An angle of revolution is 360°
3	$c = 115$	An angle of revolution is 360°
4	$d = 145$	An angle of revolution is 360°
5	$e = 125$	An angle of revolution is 360°
6	$f = 102$	An angle of revolution is 360°
7	$g = 135$	An angle of revolution is 360°
8	$h = 70$	An angle of revolution is 360°
9	$j = 240$	An angle of revolution is 360°
10	$k = 155$	An angle of revolution is 360°
11	$m = 89$	An angle of revolution is 360°
12	$n = 85$	An angle of revolution is 360°
13	$p = 118$	An angle of revolution is 360°
14	$q = 175$	An angle of revolution is 360°
15	$r = 130$	An angle of revolution is 360°
16	$s = 170$	An angle of revolution is 360°
17	$t = 105$	An angle of revolution is 360°
18	$u = 132$	An angle of revolution is 360°
19	$v = 119$	An angle of revolution is 360°
20	$w = 80$	An angle of revolution is 360°

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Solutions sheet No. 44		Mixed Angle Properties 1
	Answer	**Reason**
1	$a = 93$	An angle of revolution is 360°
2	$b = 94$	Straight angles are supplementary (180°)
3	$c = 138$	Vertically opposite angles are equal.
4	$d = 151$	An angle of revolution is 360°
5	$e = 90$	Straight angles are supplementary (180°)
6	$f = 150$	Vertically opposite angles are equal.
7	$g = 117$	An angle of revolution is 360°
8	$h = 69$	Straight angles are supplementary (180°)
9	$j = 61$	Straight angles are supplementary (180°)
10	$k = 104$	Vertically opposite angles are equal.
11	$m = 101$	Straight angles are supplementary (180°)
12	$n = 75$	An angle of revolution is 360°
13	$p = 98$	Vertically opposite angles are equal.
14	$q = 55$	Straight angles are supplementary (180°)
15	$r = 110$	Vertically opposite angles are equal.
16	$s = 61$	Straight angles are supplementary (180°)
17	$t = 90$	Vertically opposite angles are equal.
18	$u = 123$	An angle of revolution is 360°
19	$v = 39$	Straight angles are supplementary (180°)
20	$w = 141$	Straight angles are supplementary (180°)

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Solutions sheet No. 45	Corresponding Angles	
	Answer	**Reason**
1	$a = 60$	Corresponding angles in parallel lines are equal
2	$b = 80$	Corresponding angles in parallel lines are equal
3	$c = 100$	Corresponding angles in parallel lines are equal
4	$d = 72$	Corresponding angles in parallel lines are equal
5	$e = 69$	Corresponding angles in parallel lines are equal
6	$f = 52$	Corresponding angles in parallel lines are equal
7	$g = 134$	Corresponding angles in parallel lines are equal
8	$h = 118$	Corresponding angles in parallel lines are equal
9	$i = 43$	Corresponding angles in parallel lines are equal
10	$j = 138$	Corresponding angles in parallel lines are equal
11	$k = 68$	Corresponding angles in parallel lines are equal
12	$l = 71$	Corresponding angles in parallel lines are equal
13	$m = 100$	Corresponding angles in parallel lines are equal
14	$n = 125$	Corresponding angles in parallel lines are equal
15	$p = 117$	Corresponding angles in parallel lines are equal
16	$q = 57$	Corresponding angles in parallel lines are equal
17	$r = 40$	Corresponding angles in parallel lines are equal
18	$s = 106$	Corresponding angles in parallel lines are equal
19	$t = 103$	Corresponding angles in parallel lines are equal
20	$u = 122$	Corresponding angles in parallel lines are equal

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Solutions sheet No. 46	Alternate Angles	
	Answer	**Reason**
1	$a = 50$	Alternate angles in parallel lines are equal
2	$b = 75$	Alternate angles in parallel lines are equal
3	$c = 110$	Alternate angles in parallel lines are equal
4	$d = 61$	Alternate angles in parallel lines are equal
5	$e = 67$	Alternate angles in parallel lines are equal
6	$f = 58$	Alternate angles in parallel lines are equal
7	$g = 132$	Alternate angles in parallel lines are equal
8	$h = 73$	Alternate angles in parallel lines are equal
9	$i = 41$	Alternate angles in parallel lines are equal
10	$j = 46$	Alternate angles in parallel lines are equal
11	$k = 118$	Alternate angles in parallel lines are equal
12	$l = 102$	Alternate angles in parallel lines are equal
13	$m = 45$	Alternate angles in parallel lines are equal
14	$n = 98$	Alternate angles in parallel lines are equal
15	$p = 115$	Alternate angles in parallel lines are equal
16	$q = 54$	Alternate angles in parallel lines are equal
17	$r = 71$	Alternate angles in parallel lines are equal
18	$s = 121$	Alternate angles in parallel lines are equal
19	$t = 107$	Alternate angles in parallel lines are equal
20	$u = 90$	Alternate angles in parallel lines are equal

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Solutions sheet No. 47	Cointerior Angles	
	Answer	**Reason**
1	$a = 85$	Cointerior angles in parallel lines are supplementary (add to 180°)
2	$b = 100$	Cointerior angles in parallel lines are supplementary (add to 180°)
3	$c = 106$	Cointerior angles in parallel lines are supplementary (add to 180°)
4	$d = 56$	Cointerior angles in parallel lines are supplementary (add to 180°)
5	$e = 120$	Cointerior angles in parallel lines are supplementary (add to 180°)
6	$f = 68$	Cointerior angles in parallel lines are supplementary (add to 180°)
7	$g = 97$	Cointerior angles in parallel lines are supplementary (add to 180°)
8	$h = 71$	Cointerior angles in parallel lines are supplementary (add to 180°)
9	$i = 116$	Cointerior angles in parallel lines are supplementary (add to 180°)
10	$j = 39$	Cointerior angles in parallel lines are supplementary (add to 180°)
11	$k = 85$	Cointerior angles in parallel lines are supplementary (add to 180°)
12	$l = 90$	Cointerior angles in parallel lines are supplementary (add to 180°)
13	$m = 76$	Cointerior angles in parallel lines are supplementary (add to 180°)
14	$n = 55$	Cointerior angles in parallel lines are supplementary (add to 180°)
15	$p = 61$	Cointerior angles in parallel lines are supplementary (add to 180°)
16	$q = 64$	Cointerior angles in parallel lines are supplementary (add to 180°)
17	$r = 40$	Cointerior angles in parallel lines are supplementary (add to 180°)
18	$s = 76$	Cointerior angles in parallel lines are supplementary (add to 180°)
19	$t = 50$	Cointerior angles in parallel lines are supplementary (add to 180°)
20	$u = 90$	Cointerior angles in parallel lines are supplementary (add to 180°)

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Solutions sheet No. 48	Mixed Parallel Properties	
	Answer	**Reason**
1	$a = 106$	Corresponding angles in parallel lines are equal
2	$b = 85$	Cointerior angles in parallel lines are supplementary (add to 180°)
3	$c = 68$	Cointerior angles in parallel lines are supplementary (add to 180°)
4	$d = 63$	Corresponding angles in parallel lines are equal
5	$e = 71$	Alternate angles in parallel lines are equal
6	$f = 54$	Corresponding angles in parallel lines are equal
7	$g = 133$	Corresponding angles in parallel lines are equal
8	$h = 142$	Alternate angles in parallel lines are equal
9	$i = 40$	Alternate angles in parallel lines are equal
10	$j = 70$	Cointerior angles in parallel lines are supplementary (add to 180°)
11	$k = 115$	Alternate angles in parallel lines are equal
12	$l = 73$	Corresponding angles in parallel lines are equal
13	$m = 103$	Alternate angles in parallel lines are equal
14	$n = 120$	Cointerior angles in parallel lines are supplementary (add to 180°)
15	$p = 109$	Corresponding angles in parallel lines are equal
16	$q = 56$	Corresponding angles in parallel lines are equal
17	$r = 90$	Cointerior angles in parallel lines are supplementary (add to 180°)
18	$s = 125$	Alternate angles in parallel lines are equal
19	$t = 44$	Alternate angles in parallel lines are equal
20	$u = 73$	Cointerior angles in parallel lines are supplementary (add to 180°)

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Solutions sheet No. 49	Mixed Angle Sums 2	
	Answer	**Reason**
1	$a = 145$	Vertically opposite angles are equal.
2	$b = 60$	Angle sum of a triangle (180°)
3	$c = 96$	Straight angles are supplementary (180°)
4	$d = 130$	An angle of revolution is 360°
5	$e = 56$	Angle sum of a triangle (180°)
6	$f = 87$	Straight angles are supplementary (180°)
7	$g = 125$	Vertically opposite angles are equal.
8	$h = 70$	An angle of revolution is 360°
9	$j = 60$	Angle sum of a triangle (180°)
10	$k = 24$	Angle sum of a triangle (180°)
11	$m = 89$	An angle of revolution is 360°
12	$n = 30$	Angle sum of a triangle (180°)
13	$p = 119$	Angle sum of a triangle (180°)
14	$q = 25$	Vertically opposite angles are equal (including a right angle)
15	$r = 29$	Straight angles are supplementary (180°) (including a right angle)
16	$s = 56$	Angle sum of a triangle (180°)
17	$t = 90$	Vertically opposite angles are equal.
18	$u = 54$	Straight angles are supplementary (180°)
19	$v = 123$	An angle of revolution is 360°
20	$w = 63$	Angle sum of a triangle (180°)

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Solutions sheet No. 50	Angle Sum of Triangles	
	Answer	**Reason**
1	$a = 60$	Angle sum of a triangle is 180°
2	$b = 60$	Angle sum of a triangle is 180°
3	$c = 35$	Angle sum of a triangle is 180°
4	$d = 58$	Angle sum of a triangle is 180°
5	$e = 72$	Angle sum of a triangle is 180°
6	$f = 51$	Angle sum of a triangle is 180°
7	$g = 24$	Angle sum of a triangle is 180°
8	$h = 57$	Angle sum of a triangle is 180°
9	$i = 60$	Angle sum of a triangle is 180°
10	$j = 117$	Angle sum of a triangle is 180°
11	$k = 55$	Angle sum of a triangle is 180°
12	$l = 65$	Angle sum of a triangle is 180°
13	$m = 119$	Angle sum of a triangle is 180°
14	$n = 61$	Angle sum of a triangle is 180°
15	$p = 24$	Angle sum of a triangle is 180°
16	$q = 40$	Angle sum of a triangle is 180°
17	$r = 51$	Angle sum of a triangle is 180°
18	$s = 78$	Angle sum of a triangle is 180°
19	$t = 27$	Angle sum of a triangle is 180°
20	$u = 45$	Angle sum of a triangle is 180°

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Solutions sheet No. 51	Angle Sum of a Quadrilateral	
	Answer	**Reason**
1	$a = 85$	Angle sum of a quadrilateral
2	$b = 75$	Angle sum of a quadrilateral
3	$c = 104$	Angle sum of a quadrilateral
4	$d = 101$	Angle sum of a quadrilateral
5	$e = 124$	Angle sum of a quadrilateral
6	$f = 77$	Angle sum of a quadrilateral
7	$g = 100$	Angle sum of a quadrilateral
8	$h = 108$	Angle sum of a quadrilateral
9	$j = 41$	Angle sum of a quadrilateral
10	$k = 114$	Angle sum of a quadrilateral
11	$m = 93$	Angle sum of a quadrilateral
12	$n = 105$	Angle sum of a quadrilateral
13	$p = 95$	Angle sum of a quadrilateral
14	$q = 89$	Angle sum of a quadrilateral
15	$r = 88$	Angle sum of a quadrilateral
16	$s = 92$	Angle sum of a quadrilateral
17	$t = 89$	Angle sum of a quadrilateral
18	$u = 79$	Angle sum of a quadrilateral
19	$v = 85$	Angle sum of a quadrilateral
20	$w = 189$	Angle sum of a quadrilateral

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Solutions sheet No. 52		Mixed Angle Sums 3
	Answer	**Reason**
1	$a = 53$	Corresponding angles in parallel lines are equal
2	$b = 63$	Straight angles are supplementary (180°)
3	$c = 69$	Angle sum of a triangle (180°)
4	$d = 70$	Cointerior angles in parallel lines are supplementary (add to 180°)
5	$e = 149$	An angle of revolution is 360°
6	$f = 98$	An angle of revolution is 360°
7	$g = 180$	Alternate angles in parallel lines are equal
8	$h = 90$	Cointerior angles in parallel lines are supplementary (add to 180°)
9	$j = 95$	Vertically opposite angles are equal
10	$k = 72$	Cointerior angles in parallel lines are supplementary (add to 180°)
11	$m = 102$	Straight angles are supplementary (180°)
12	$n = 42$	Angle sum of a triangle (180°)
13	$p = 101$	Alternate angles in parallel lines are equal
14	$q = 38$	Straight angles are supplementary (180°)
15	$r = 105$	Corresponding angles in parallel lines are equal
16	$s = 103$	Corresponding angles in parallel lines are equal
17	$t = 75$	An angle of revolution is 360°
18	$u = 43$	Alternate angles in parallel lines are equal
19	$v = 69$	Cointerior angles in parallel lines are supplementary (add to 180°)
20	$w = 27$	Angle sum of a triangle (180°)

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Solutions sheet No. 53		Exterior Angle of a Triangle
	Answer	**Reason**
1	*a* =	
2	*b* =	
3	*c* =	
4	*d* =	
5	*e* =	
6	*f* =	
7	*g* =	Exterior angle of a triangle equals the sum of the remote interior angles
8	*h* =	
9	*i* =	
10	*j* =	
11	*k* =	
12	*l* =	
13	*m* =	
14	*n* =	
15	*p* =	
16	*q* =	
17	*r* =	
18	*s* =	
19	*t* =	
20	*u* =	

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Solutions sheet No. 54	Mixed Angle Sums 4	
	Answer	**Reason**
1	$a = 47$	Straight angles are supplementary (180°)
2	$b = 62$	Angle sum of a triangle (180°)
3	$c = 94$	Angle sum of a quadrilateral (360°)
4	$d = 114$	Cointerior angles in parallel lines are supplementary (add to 180°)
5	$e = 81$	Vertically opposite angles are equal
6	$f = 57$	Alternate angles in parallel lines are equal
7	$g = 100$	Exterior angle of a triangle equals the sum of the remote interior angles
8	$h = 122$	Corresponding angles in parallel lines are equal
9	$j = 57$	Angle sum of a triangle (180°)
10	$k = 93$	An angle of revolution is 360°
11	$m = 59$	Corresponding angles in parallel lines are equal
12	$n = 97$	Alternate angles in parallel lines are equal
13	$p = 61$	Cointerior angles in parallel lines are supplementary (add to 180°)
14	$q = 97$	Alternate angles in parallel lines are equal
15	$r = 45$	Exterior angle of a triangle equals the sum of the remote interior angles
16	$s = 27$	Angle sum of a triangle (180°)
17	$t = 99$	Exterior angle of a triangle equals the sum of the remote interior angles
18	$u = 37$	Angle sum of a quadrilateral (360°)
19	$v = 113$	Vertically opposite angles are equal
20	$w = 87$	Angle sum of a quadrilateral (360°)

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Solutions sheet No. 55		Special Triangles
	Answer	**Reason**
1	$a = 30$	Angle sum of an isosceles triangle.
2	$b = 70$	Angle sum of an isosceles triangle.
3	$c = 30$	Angle sum of a triangle.
4	$d = 45$	Angle sum of an isosceles triangle.
5	$e = 72$	Angle sum of an isosceles triangle.
6	$f = 54$	Angle sum of an isosceles triangle.
7	$g = 122$	Angle sum of an isosceles triangle.
8	$h = 60$	Angle of an equilateral triangle.
9	$j = 60$	Angle sum of a triangle.
10	$k = 124$	Angle sum of an isosceles triangle.
11	$m = 111$	Equal angles of an isosceles triangle and straight angle.
12	$n = 102$	Equal angles of an isosceles triangle and straight angle.
13	$p = 108$	Angle sum of an isosceles triangle and straight angle.
14	$q = 120$	Angle of an equilateral triangle and straight angle.
15	$r = 135$	Angle of an isosceles triangle and straight angle.
16	$s = 130$	Angle sum of an isosceles triangle and straight angle.
17	$t = 116$	Angle sum of an isosceles triangle and straight angle.
18	$u = 114$	Angle sum of an isosceles triangle and straight angle.
19	$v = 73½$	Angle sum of an isosceles triangle.
20	$w = 44$	Straight angle and angle sum of an isosceles triangle.

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Solutions sheet No. 56		Mixed Angle Sums 5
	Answer	**Reason**
1	$a = 165$	Angle sum of a quadrilateral (360°)
2	$b = 65$	Angle sum of an isosceles triangle
3	$c = 70$	Cointerior angles in parallel lines are supplementary (add to 180°)
4	$d = 152$	An angle of revolution is 360°
5	$e = 125$	Exterior angle of a triangle equals the sum of the remote interior angles
6	$f = 561$	Angle sum of a triangle (180°)
7	$g = 110$	Opposite angle of a parallelogram are equal
8	$h = 112$	Alternate angles in parallel lines are equal
9	$j = 72$	Straight angles are supplementary (180°)
10	$k = 41$	Straight angles are supplementary (180°)
11	$m = 31$	Straight angles are supplementary (180°)
12	$n = 106$	Exterior angle of a triangle equals the sum of the remote interior angles
13	$p = 44$	Alternate angles in parallel lines are equal
14	$q = 52$	Vertically opposite angles are equal
15	$r = 76$	Cointerior angles in parallel lines are supplementary (add to 180°)
16	$s = 108$	Exterior angle of an isosceles triangle equals the sum of the remote interior angles
17	$t = 113$	Corresponding angles in parallel lines are equal
18	$u = 50$	Angle sum of a triangle (180°)
19	$v = 160$	An angle in an equilateral triangle (all equal 60°)
20	$w = 84$	Angle sum of a quadrilateral (360°)

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Solutions sheet No. 75	**Trigonometric Functions**		
1) $\sin 54°$ $= 0.809$	11) $12\tan 74°$ $= 41.849$	21) $\frac{\cos 45°}{4}$ $= 0.177$	31) $\frac{14\tan 41°}{2}$ $= 6.085$
2) $\sin 46°$ $= 0.719$	12) $12\sin 88°$ $= 11.993$	22) $\frac{\sin 51°}{4}$ $= 0.194$	32) $\frac{38\tan 63°}{3}$ $= 24.860$
3) $\tan 34°$ $= 0.675$	13) $3\sin 25°$ $= 1.268$	23) $\frac{\cos 66°}{9}$ $= 0.045$	33) $\frac{10\cos 13°}{9}$ $= 1.083$
4) $\cos 34°$ $= 0.829$	14) $3\sin 77°$ $= 2.923$	24) $\frac{\cos 47°}{10}$ $= 0.068$	34) $\frac{9\sin 25°}{5}$ $= 0.761$
5) $\tan 50°$ $= 1.192$	15) $11\sin 52°$ $= 8.668$	25) $\frac{\sin 18°}{10}$ $= 0.031$	35) $\frac{18\cos 11°}{3}$ $= 5.890$
6) $\cos 52°$ $= 0.616$	16) $10\cos 50°$ $= 6.428$	26) $\frac{\tan 25°}{7}$ $= 0.067$	36) $\frac{34\cos 30°}{2}$ $= 14.722$
7) $\tan 40°$ $= 0.839$	17) $10\tan 29°$ $= 5.543$	27) $\frac{\sin 64°}{2}$ $= 0.449$	37) $\frac{31\sin 60°}{9}$ $= 2.983$
8) $\tan 46°$ $= 1.036$	18) $2\tan 82°$ $= 14.231$	28) $\frac{\tan 41°}{12}$ $= 0.072$	38) $\frac{23\tan 60°}{6}$ $= 6.640$
9) $\sin 81°$ $= 0.988$	19) $14\cos 70°$ $= 4.788$	29) $\frac{\cos 25°}{13}$ $= 0.070$	39) $\frac{22\cos 11°}{5}$ $= 4.319$
10) $\sin 68°$ $= 0.927$	20) $12\cos 33°$ $= 10.064$	30) $\frac{\tan 31°}{9}$ $= 0.067$	40) $\frac{27\cos 31°}{5}$ $= 4.629$

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Solutions sheet No. 76				Sine Ratio - Find a Side 1				
Working								
No.	**Opp**	**Adj**	**Hyp**	**Angle**	**Equation**	**Calculator**	**1 Dec. Place**	**Solution**
1	a		10	30	$a = 10\sin 30$	5	5	$a = 5$
2	b		100	40	$b = 100\sin 40$	64.278761	64.3	$b = 64.3$
3	c		8	35	$c = 8\sin 35$	4.5886115	4.6	$c = 4.6$
4	d		5	60	$d = 5\sin 60$	4.330127	4.3	$d = 4.3$
5	e		7	40	$e = 7\sin 40$	4.4995133	4.5	$e = 4.5$
6	f		20	38	$f = 20\sin 38$	12.31323	12.3	$f = 12.3$
7	g		30	27	$g = 30\sin 27$	13.619715	13.6	$g = 13.6$
8	h		45	39	$h = 45\sin 39$	28.319418	28.3	$h = 28.3$
9	i		150	36	$i = 150\sin 36$	88.167788	88.2	$i = 88.2$
10	j		12	52	$j = 12\sin 52$	9.456129	9.5	$j = 9.5$
11	k		85	57	$k = 85\sin 57$	71.286998	71.3	$k = 71.3$
12	l		125	42	$l = 125\sin 42$	83.641326	83.6	$l = 83.6$
13	m		40	43	$m = 40\sin 43$	27.279934	27.3	$m = 27.3$
14	n		37	22	$n = 37\sin 22$	13.860444	13.9	$n = 13.9$
15	p		25	51	$p = 25\sin 51$	19.428649	19.4	$p = 19.4$
16	q		2.7	47	$q = 2.7\sin 47$	1.974655	2	$q = 2$
17	r		0.07	56	$r = 0.07\sin 56$	0.0580326	0.1	$r = 0.1$
18	s		4.2	65	$s = 4.2\sin 65$	3.8064927	3.8	$s = 3.8$
19	t		3.8	78	$t = 3.8\sin 78$	3.7169609	3.7	$t = 3.7$
20	u		4.75	71	$u = 4.75\sin 71$	4.4912132	4.5	$u = 4.5$

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Solutions sheet No. 77				Cosine Ratio - Find a Side 1				
Working								
No.	**Opp**	**Adj**	**Hyp**	**Angle**	**Equation**	**Calculator**	**1 Dec. Place**	**Solution**
1		*a*	8	44	*a* = 8cos44	5.7547184	5.8	*a* = 5.8
2		*b*	20	39	*b* = 20cos39	15.542919	15.5	*b* = 15.5
3		*c*	40	50	*c* = 40cos50	25.711504	25.7	*c* = 25.7
4		*d*	5	37	*d* = 5cos37	3.9931776	4	*d* = 4
5		*e*	7	60	*e* = 7cos60	3.5	3.5	*e* = 3.5
6		*f*	45	48	*f* = 45cos48	30.110877	30.1	*f* = 30.1
7		*g*	65	41	*g* = 65cos41	49.056123	49.1	*g* = 49.1
8		*h*	75	21	*h* = 75cos21	70.018532	70	*h* = 70
9		*i*	32	43	*i* = 32cos43	23.403318	23.4	*i* = 23.4
10		*j*	29	28	*j* = 29cos28	25.60548	25.6	*j* = 25.6
11		*k*	10	70	*k* = 10cos70	3.4202014	3.4	*k* = 3.4
12		*l*	39	35	*l* = 39cos35	31.94693	31.9	*l* = 31.9
13		*m*	145	48	*m* = 145cos48	97.023938	97	*m* = 97
14		*n*	250	62	*n* = 250cos62	117.36789	117.4	*n* = 117.4
15		*p*	125	75	*p* = 125cos75	32.352381	32.4	*p* = 32.4
16		*q*	5.1	68	*q* = 5.1cos68	1.9104936	1.9	*q* = 1.9
17		*r*	2.6	80	*r* = 2.6cos80	0.4514853	0.5	*r* = 0.5
18		*s*	3.08	47	*s* = 3.08cos47	2.1005549	2.1	*s* = 2.1
19		*t*	4.2	55	*t* = 4.2cos55	2.409021	2.4	*t* = 2.4
20		*u*	0.7	56	*u* = 0.7cos56	0.391435	0.4	*u* = 0.4

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Solutions sheet No. 78				Tangent Ratio - Find a Side 1				
Working								
No.	**Opp**	**Adj**	**Hyp**	**Angle**	**Equation**	**Calculator**	**1 Dec. Place**	**Solution**
1	a	10		35	$a = 10\tan 35$	7.0020754	7	$a = 7$
2	b	25		40	$b = 25\tan 40$	20.977491	21	$b = 21$
3	c	40		38	$c = 40\tan 38$	31.251425	31.3	$c = 31.3$
4	d	80		41	$d = 80\tan 41$	69.542939	69.5	$d = 69.5$
5	e	75		38	$e = 75\tan 38$	58.596422	58.6	$e = 58.6$
6	f	125		37	$f = 125\tan 37$	94.194256	94.2	$f = 94.2$
7	g	65		55	$g = 65\tan 55$	92.82962	92.8	$g = 92.8$
8	h	85		43	$h = 85\tan 43$	79.263782	79.3	$h = 79.3$
9	i	7		65	$i = 7\tan 65$	15.011548	15	$i = 15$
10	j	12		26	$j = 12\tan 26$	5.8527911	5.9	$j = 5.9$
11	k	125		28	$k = 125\tan 28$	66.463679	66.5	$k = 66.5$
12	l	225		36	$l = 225\tan 36$	163.47207	163.5	$l = 163.5$
13	m	17		47	$m = 17\tan 47$	18.230268	18.2	$m = 18.2$
14	n	3.8		25	$n = 3.8\tan 25$	1.7719691	1.8	$n = 1.8$
15	p	4.6		44	$p = 4.6\tan 44$	4.4421684	4.4	$p = 4.4$
16	q	3.2		59	$q = 3.2\tan 59$	5.3256943	5.3	$q = 5.3$
17	r	12.6		27	$r = 12.6\tan 27$	6.4200207	6.4	$r = 6.4$
18	s	5.8		52	$s = 5.8\tan 52$	7.4236615	7.4	$s = 7.4$
19	t	0.82		56	$t = 0.82\tan 56$	1.2157	1.2	$t = 1.2$
20	u	2.71		32	$u = 2.71\tan 32$	1.6933959	1.7	$u = 1.7$

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Solutions sheet No. 79	Sine Ratio - Find an Angle 1							
No.	**Working**							**Solution**
	Opp	**Adj**	**Hyp**	**Angle**	**Equation**	**Calculator**	**Nearest °**	
1	9		15	a	$a = \sin^{-1}(9/15)$	36.869898	37	$a = 37$
2	140		200	b	$b = \sin^{-1}(140/200)$	44.427004	44	$b = 44$
3	6		9	c	$c = \sin^{-1}(6/9)$	41.810315	42	$c = 42$
4	4		5	d	$d = \sin^{-1}(4/5)$	53.130102	53	$d = 53$
5	6		7	e	$e = \sin^{-1}(6/7)$	58.997281	59	$e = 59$
6	21		30	f	$f = \sin^{-1}(21/30)$	44.427004	44	$f = 44$
7	90		170	g	$g = \sin^{-1}(90/170)$	31.965719	32	$g = 32$
8	38		55	h	$h = \sin^{-1}(38/55)$	43.702114	44	$h = 44$
9	65		80	i	$i = \sin^{-1}(65/80)$	54.340912	54	$i = 54$
10	10		14	j	$j = \sin^{-1}(10/14)$	45.584691	46	$j = 46$
11	26		46	k	$k = \sin^{-1}(26/46)$	34.417389	34	$k = 34$
12	200		325	l	$l = \sin^{-1}(200/325)$	37.979872	38	$l = 38$
13	32		50	m	$m = \sin^{-1}(32/50)$	39.791819	40	$m = 40$
14	100		270	n	$n = \sin^{-1}(100/270)$	21.738461	22	$n = 22$
15	18		25	p	$p = \sin^{-1}(18/25)$	46.05448	46	$p = 46$
16	7.8		9.2	q	$q = \sin^{-1}(7.8/9.2)$	57.976004	58	$q = 58$
17	1.3		2	r	$r = \sin^{-1}(1.3/2)$	40.541602	41	$r = 41$
18	3.5		4.5	s	$s = \sin^{-1}(3.5/4.5)$	51.057559	51	$s = 51$
19	4		4.8	t	$t = \sin^{-1}(4/4.8)$	56.44269	56	$t = 56$
20	760		1000	u	$u = \sin^{-1}(760/1000)$	49.464198	49	$u = 49$

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Solutions sheet No. 80				Cosine Ratio - Find an Angle 1				
Working								
No.	**Opp**	**Adj**	**Hyp**	**Angle**	**Equation**	**Calculator**	**Nearest °**	**Solution**
1		*7*	9	*a*	$a = \cos^{-1}(7/9)$	38.942441	39	$a = 39$
2		*13*	25	*b*	$b = \cos^{-1}(13/25)$	58.667749	59	$b = 59$
3		*41*	50	*c*	$c = \cos^{-1}(41/50)$	34.915206	35	$c = 35$
4		*4*	6	*d*	$d = \cos^{-1}(4/6)$	48.189685	48	$d = 48$
5		*4*	8	*e*	$e = \cos^{-1}(4/8)$	60	60	$e = 60$
6		*36*	48	*f*	$f = \cos^{-1}(36/48)$	41.409622	41	$f = 41$
7		*48*	64	*g*	$g = \cos^{-1}(48/64)$	41.409622	41	$g = 41$
8		*60*	72	*h*	$h = \cos^{-1}(60/72)$	33.55731	34	$h = 34$
9		*20*	34	*i*	$i = \cos^{-1}(20/34)$	53.968121	54	$i = 54$
10		*22*	31	*j*	$j = \cos^{-1}(22/31)$	44.791325	45	$j = 45$
11		*5*	11	*k*	$k = \cos^{-1}(5/11)$	62.964308	63	$k = 63$
12		*26*	38	*l*	$l = \cos^{-1}(26/38)$	46.826449	47	$l = 47$
13		*80*	140	*m*	$m = \cos^{-1}(80/140)$	55.150095	55	$m = 55$
14		*100*	260	*n*	$n = \cos^{-1}(100/260)$	67.380135	67	$n = 67$
15		*60*	135	*p*	$p = \cos^{-1}(60/135)$	63.6122	64	$p = 64$
16		*2.5*	5.5	*q*	$q = \cos^{-1}(2.5/5.5)$	62.964308	63	$q = 63$
17		*1.2*	2.7	*r*	$r = \cos^{-1}(1.2/2.7)$	63.6122	64	$r = 64$
18		*6*	9.3	*s*	$s = \cos^{-1}(6/9.3)$	49.82223	50	$s = 50$
19		*2.8*	4.3	*t*	$t = \cos^{-1}(2.8/4.3)$	49.370671	49	$t = 49$

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Solutions sheet No. 81				Tangent Ratio - Find an Angle 1				
Working								
No.	**Opp**	**Adj**	**Hyp**	**Angle**	**Equation**	**Calculator**	**Nearest °**	**Solution**
1	6	10		a	$a = \tan^{-1}(6/10)$	30.963757	31	$a = 31$
2	20	25		b	$b = \tan^{-1}(20/25)$	38.659808	39	$b = 39$
3	30	40		c	$c = \tan^{-1}(30/40)$	36.869898	37	$c = 37$
4	70	80		d	$d = \tan^{-1}(70/80)$	41.185925	41	$d = 41$
5	50	75		e	$e = \tan^{-1}(50/75)$	33.690068	34	$e = 34$
6	60	125		f	$f = \tan^{-1}(60/125)$	25.641006	26	$f = 26$
7	110	65		g	$g = \tan^{-1}(110/65)$	59.420773	59	$g = 59$
8	70	85		h	$h = \tan^{-1}(70/85)$	39.47246	39	$h = 39$
9	18	10		i	$i = \tan^{-1}(18/10)$	60.945396	61	$i = 61$
10	7	11		j	$j = \tan^{-1}(7/11)$	32.471192	32	$j = 32$
11	80	135		k	$k = \tan^{-1}(80/135)$	30.650668	31	$k = 31$
12	160	220		l	$l = \tan^{-1}(160/220)$	36.027373	36	$l = 36$
13	20	17		m	$m = \tan^{-1}(20/17)$	49.635463	50	$m = 50$
14	2.6	3.7		n	$n = \tan^{-1}(2.6/3.7)$	35.095817	35	$n = 35$
15	5.7	4.8		p	$p = \tan^{-1}(5.7/4.8)$	49.899092	50	$p = 50$
16	5	3.3		q	$q = \tan^{-1}(5/3.3)$	56.575189	57	$q = 57$
17	9.1	14.3		r	$r = \tan^{-1}(9.1/14.3)$	32.471192	32	$r = 32$
18	7.2	5.8		s	$s = \tan^{-1}(7.2/5.8)$	51.146626	51	$s = 51$
19	1.25	0.85		t	$t = \tan^{-1}(1.25/0.85)$	55.784298	56	$t = 56$
20	1.94	2.81		u	$u = \tan^{-1}(1.94/2.81)$	34.620868	35	$u = 35$

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Solutions sheet No. 82				Sine Ratio - Find a Side (degrees & minutes)				
Working								
No.	**Opp**	**Adj**	**Hyp**	**Angle**	**Equation**	**Calculator**	**1 Dec. Place**	**Solution**
1	*a*		100	25°35'	$a = 100\sin 25°35'$	43.18234	43.2	$a = 43.2$
2	*b*		135	46°36'	$b = 135\sin 46°36'$	98.087581	98.1	$b = 98.1$
3	*c*		49	38°4'	$c = 49\sin 38°4'$	30.21232	30.2	$c = 30.2$
4	*d*		70	22°58'	$d = 70\sin 22°58'$	27.313687	27.3	$d = 27.3$
5	*e*		340	33°40'	$e = 340\sin 33°40'$	188.48251	188.5	$e = 188.5$
6	*f*		260	39°54'	$f = 260\sin 39°54'$	166.7769	166.8	$f = 166.8$
7	*g*		4.2	61°38'	$g = 4.2\sin 61°38'$	3.6956855	3.7	$g = 3.7$
8	*h*		55	41°53'	$h = 55\sin 41°53'$	36.718881	36.7	$h = 36.7$
9	*i*		4250	33°44'	$i = 4250\sin 33°44'$	2360.1455	2360.1	$i = 2360.1$
10	*j*		600	71°25'	$j = 600\sin 71°25'$	568.71669	568.7	$j = 568.7$
11	*k*		175	48°40'	$k = 175\sin 48°40'$	131.40401	131.4	$k = 131.4$
12	*l*		45	38°30'	$l = 45\sin 38°30'$	28.013159	28	$l = 28$
13	*m*		110	44°55'	$m = 110\sin 44°55'$	77.668535	77.7	$m = 77.7$
14	*n*		70	44°10'	$n = 70\sin 44°10'$	48.772353	48.8	$n = 48.8$
15	*p*		6	60°25'	$p = 6\sin 60°25'$	5.2178314	5.2	$p = 5.2$
16	*q*		43.7	65°38'	$q = 43.7\sin 65°38'$	39.807372	39.8	$q = 39.8$
17	*r*		425	76°32'	$r = 425\sin 76°32'$	413.31487	413.3	$r = 413.3$
18	*s*		35	57°28'	$s = 35\sin 57°28'$	29.507755	29.5	$s = 29.5$
19	*t*		500	40°50'	$t = 500\sin 40°50'$	326.93045	326.9	$t = 326.9$
20	*u*		125	57°16'	$u = 125\sin 57°16'$	105.14954	105.1	$u = 105.1$

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Solutions sheet No. 83				Cosine Ratio - Find a Side (degrees & minutes)				
Working								
No.	**Opp**	**Adj**	**Hyp**	**Angle**	**Equation**	**Calculator**	**1 Dec. Place**	**Solution**
1		*a*	20	29°25'	*a* = 20cos29°25'	17.42142	17.4	*a* = 17.4
2		*b*	90	41°42'	*b* = 90cos41°42'	67.197436	67.2	*b* = 67.2
3		*c*	25	32°8'	*c* = 25cos32°8'	21.170316	21.2	*c* = 21.2
4		*d*	55	61°45'	*d* = 55cos61°45'	26.032582	26	*d* = 26
5		*e*	60	40°26'	*e* = 60cos40°26'	45.669667	45.7	*e* = 45.7
6		*f*	120	37°50'	*f* = 120cos37°50'	94.775796	94.8	*f* = 94.8
7		*g*	75	28°36'	*g* = 75cos28°36'	65.848723	65.8	*g* = 65.8
8		*h*	45	37°48'	*h* = 45cos37°48'	35.556976	35.6	*h* = 35.6
9		*i*	250	38°5'	*i* = 250cos38°5'	196.77862	196.8	*i* = 196.8
10		*j*	35	55°46'	*j* = 35cos55°46'	19.689756	19.7	*j* = 19.7
11		*k*	94	55°35'	*k* = 94cos55°35'	53.129458	53.1	*k* = 53.1
12		*l*	125	42°6'	*l* = 125cos42°6'	92.74698	92.7	*l* = 92.7
13		*m*	61	42°47'	*m* = 61cos42°47'	44.769576	44.8	*m* = 44.8
14		*n*	85	20°53'	*n* = 85cos20°53'	79.416197	79.4	*n* = 79.4
15		*p*	25	51°16'	*p* = 25cos51°16'	15.642415	15.6	*p* = 15.6
16		*q*	180	48°17'	*q* = 180cos48°17'	119.78055	119.8	*q* = 119.8
17		*r*	14.6	54°15'	*r* = 14.6cos54°15'	8.5300451	8.5	*r* = 8.5
18		*s*	4.2	63°32'	*s* = 4.2cos63°32'	1.8718438	1.9	*s* = 1.9
19		*t*	3.25	58°51'	*t* = 3.25cos58°51'	1.6811612	1.7	*t* = 1.7
20		*u*	7.5	73°25'	*u* = 7.5cos73°25'	2.1405719	2.1	*u* = 2.1

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Solutions sheet No. 84				Tangent Ratio - Find a Side (degrees & minutes)				
Working								
No.	**Opp**	**Adj**	**Hyp**	**Angle**	**Equation**	**Calculator**	**1 Dec. Place**	**Solution**
1	*a*	90		56°35'	$a = 90\tan 56°35'$	136.40581	136.4	$a = 136.4$
2	*b*	100		41°25'	$b = 100\tan 41°25'$	88.213571	88.2	$b = 88.2$
3	*c*	25		48°40'	$c = 25\tan 48°40'$	28.423536	28.4	$c = 28.4$
4	*d*	25		65°45'	$d = 25\tan 65°45'$	55.497942	55.5	$d = 55.5$
5	*e*	160		48°50'	$e = 160\tan 48°50'$	182.98121	183	$e = 183$
6	*f*	28		42°42'	$f = 28\tan 42°42'$	25.837656	25.8	$f = 25.8$
7	*g*	2500		24°55'	$g = 2500\tan 24°55'$	1161.3454	1161.3	$g = 1161.3$
8	*h*	115		46°18'	$h = 115\tan 46°18'$	120.34063	120.3	$h = 120.3$
9	*i*	250		38°3'	$i = 250\tan 38°3'$	195.67298	195.7	$i = 195.7$
10	*j*	12		32°14'	$j = 12\tan 32°14'$	7.5665567	7.6	$j = 7.6$
11	*k*	265		12°45'	$k = 265\tan 12°45'$	59.963378	60	$k = 60$
12	*l*	45		40°50'	$l = 45\tan 40°50'$	38.888667	38.9	$l = 38.9$
13	*m*	12		63°21'	$m = 12\tan 63°21'$	23.911305	23.9	$m = 23.9$
14	*n*	35		38°33'	$n = 35\tan 38°33'$	27.89016	27.9	$n = 27.9$
15	*p*	63		19°50'	$p = 63\tan 19°50'$	22.722807	22.7	$p = 22.7$
16	*q*	18		46°30'	$q = 18\tan 46°30'$	18.968042	19	$q = 19$
17	*r*	8.2		72°40'	$r = 8.2\tan 72°40'$	26.273323	26.3	$r = 26.3$
18	*s*	1250		66°24'	$s = 1250\tan 66°24'$	2861.137	2861.1	$s = 2861.1$
19	*t*	26.5		72°41'	$t = 26.5\tan 72°41'$	84.994617	85	$t = 85$
20	*u*	11.08		62°5'	$u = 11.08\tan 62°5'$	20.911767	20.9	$u = 20.9$

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Solutions sheet No. 85	Sine Ratio - Find an Angle (degrees & minutes)							
Working								
No.	**Opp**	**Adj**	**Hyp**	**Angle**	**Equation**	**Calculator**	**Nearest Minute**	**Solution**
1	36		62	a	$a = \sin^{-1}(36/62)$	35.495933	35°30'	$a°$ = 35°30'
2	80		155	b	$b = \sin^{-1}(80/155)$	31.072951	31°4'	$b°$ = 31°4'
3	58		95	c	$c = \sin^{-1}(58/95)$	37.627569	37°38'	$c°$ = 37°38'
4	13		15	d	$d = \sin^{-1}(13/15)$	60.073565	60°4'	$d°$ = 60°4'
5	16		25	e	$e = \sin^{-1}(16/25)$	39.791819	39°48'	$e°$ = 39°48'
6	22		30	f	$f = \sin^{-1}(22/30)$	47.166572	47°10'	$f°$ = 47°10'
7	8		13	g	$g = \sin^{-1}(8/13)$	37.979872	37°59'	$g°$ = 37°59'
8	8		17	h	$h = \sin^{-1}(8/17)$	28.072487	28°4'	$h°$ = 28°4'
9	75		90	i	$i = \sin^{-1}(75/90)$	56.44269	56°27'	$i°$ = 56°27'
10	14		18	j	$j = \sin^{-1}(14/18)$	51.057559	51°3'	$j°$ = 51°3'
11	150		210	k	$k = \sin^{-1}(150/210)$	45.584691	45°35'	$k°$ = 45°35'
12	240		350	l	$l = \sin^{-1}(240/350)$	43.291808	43°18'	$l°$ = 43°18'
13	90		240	m	$m = \sin^{-1}(90/240)$	22.024313	22°1'	$m°$ = 22°1'
14	34		50	n	$n = \sin^{-1}(34/50)$	42.843643	42°51'	$n°$ = 42°51'
15	48		65	p	$p = \sin^{-1}(48/65)$	47.600527	47°36'	$p°$ = 47°36'
16	72		96	q	$q = \sin^{-1}(72/96)$	48.590378	48°35'	$q°$ = 48°35'
17	5		6.25	r	$r = \sin^{-1}(5/6.25)$	53.130102	53°8'	$r°$ = 53°8'
18	4.5		5.5	s	$s = \sin^{-1}(4.5/5.5)$	54.903199	54°54'	$s°$ = 54°54'
19	34		43	t	$t = \sin^{-1}(34/43)$	52.250758	52°15'	$t°$ = 52°15'
20	460		500	u	$u = \sin^{-1}(460/500)$	66.926082	66°56'	$u°$ = 66°56'

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Solutions sheet No. 86				Cosine Ratio - Find an Angle (degrees & minutes)				
Working								
No.	**Opp**	**Adj**	**Hyp**	**Angle**	**Equation**	**Calculator**	**Nearest Minute**	**Solution**
1		7	10	a	$a = \cos^{-1}(7/10)$	45.572996	45°34'	$a°$ = 45°34'
2		45	60	b	$b = \cos^{-1}(45/60)$	41.409622	41°25'	$b°$ = 41°25'
3		44	60	c	$c = \cos^{-1}(44/60)$	42.833428	42°50'	$c°$ = 42°50'
4		34	46	d	$d = \cos^{-1}(34/46)$	42.342605	42°21'	$d°$ = 42°21'
5		5	9	e	$e = \cos^{-1}(5/9)$	56.251011	56°15'	$e°$ = 56°15'
6		8	14	f	$f = \cos^{-1}(8/14)$	55.150095	55°9'	$f°$ = 55°9'
7		63	75	g	$g = \cos^{-1}(63/75)$	32.85988	32°52'	$g°$ = 32°52'
8		23	35	h	$h = \cos^{-1}(23/35)$	48.917667	48°55'	$h°$ = 48°55'
9		22	31	i	$i = \cos^{-1}(22/31)$	44.791325	44°47'	$i°$ = 44°47'
10		22	35	j	$j = \cos^{-1}(22/35)$	51.055196	51°3'	$j°$ = 51°3'
11		35	49	k	$k = \cos^{-1}(35/49)$	44.415309	44°25'	$k°$ = 44°25'
12		25	36	l	$l = \cos^{-1}(25/36)$	46.017037	46°1'	$l°$ = 46°1'
13		65	145	m	$m = \cos^{-1}(65/145)$	63.366881	63°22'	$m°$ = 63°22'
14		90	220	n	$n = \cos^{-1}(90/220)$	65.85226	65°51'	$n°$ = 65°51'
15		84	130	p	$p = \cos^{-1}(84/130)$	49.747758	49°45'	$p°$ = 49°45'
16		18	29	q	$q = \cos^{-1}(18/29)$	51.633486	51°38'	$q°$ = 51°38'
17		6	9	r	$r = \cos^{-1}(6/9)$	48.189685	48°11'	$r°$ = 48°11'
18		4.5	7.5	s	$s = \cos^{-1}(4.5/7.5)$	53.130102	53°8'	$s°$ = 53°8'
19		6.8	10.2	t	$t = \cos^{-1}(6.8/10.2)$	48.189685	48°11'	$t°$ = 48°11'
20		0.5	0.9	u	$u = \cos^{-1}(0.5/0.9)$	56.251011	56°15'	$u°$ = 56°15'

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Solutions sheet No. 87				Tangent Ratio - Find an Angle (degrees & minutes)				
Working								
No.	**Opp**	**Adj**	**Hyp**	**Angle**	**Equation**	**Calculator**	**Nearest Minute**	**Solution**
1	7	12		*a*	$a = \tan^{-1}(7/12)$	30.256437	30°15'	*a*° = 30°15'
2	20	25		*b*	$b = \tan^{-1}(20/25)$	38.659808	38°40'	*b*° = 38°40'
3	30	40		*c*	$c = \tan^{-1}(30/40)$	36.869898	36°52'	*c*° = 36°52'
4	70	80		*d*	$d = \tan^{-1}(70/80)$	41.185925	41°11'	*d*° = 41°11'
5	50	75		*e*	$e = \tan^{-1}(50/75)$	33.690068	33°41'	*e*° = 33°41'
6	60	125		*f*	$f = \tan^{-1}(60/125)$	25.641006	25°38'	*f*° = 25°38'
7	110	65		*g*	$g = \tan^{-1}(110/65)$	59.420773	59°25'	*g*° = 59°25'
8	70	85		*h*	$h = \tan^{-1}(70/85)$	39.47246	39°28'	*h*° = 39°28'
9	18	10		*i*	$i = \tan^{-1}(18/10)$	60.945396	60°57'	*i*° = 60°57'
10	7	11		*j*	$j = \tan^{-1}(7/11)$	32.471192	32°28'	*j*° = 32°28'
11	80	135		*k*	$k = \tan^{-1}(80/135)$	30.650668	30°39'	*k*° = 30°39'
12	160	220		*l*	$l = \tan^{-1}(160/220)$	36.027373	36°2'	*l*° = 36°2'
13	20	17		*m*	$m = \tan^{-1}(20/17)$	49.635463	49°38'	*m*° = 49°38'
14	2.6	3.7		*n*	$n = \tan^{-1}(2.6/3.7)$	35.095817	35°6'	*n*° = 35°6'
15	5.7	4.8		*p*	$p = \tan^{-1}(5.7/4.8)$	49.899092	49°54'	*p*° = 49°54'
16	5	3.3		*q*	$q = \tan^{-1}(5/3.3)$	56.575189	56°35'	*q*° = 56°35'
17	9.1	14.3		*r*	$r = \tan^{-1}(9.1/14.3)$	32.471192	32°28'	*r*° = 32°28'
18	7.2	5.8		*s*	$s = \tan^{-1}(7.2/5.8)$	51.146626	51°9'	*s*° = 51°9'
19	1.25	0.85		*t*	$t = \tan^{-1}(1.25/0.85)$	55.784298	55°47'	*t*° = 55°47'
20	1.94	2.81		*u*	$u = \tan^{-1}(1.94/2.81)$	34.620868	34°37'	*u*° = 34°37'

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Solutions sheet No. 88					Mixed Trig Ratio - Find a Side 1				
Working using $\sin A = \frac{O}{H}$ or $\cos A = \frac{A}{H}$ or $\tan A = \frac{O}{A}$									
No.	**Opp**	**Adj**	**Hyp**	**A**	**Side**	**Equation**	**Calculator**	**Rounded**	**Solution**
1			50	25°	*a*	$a = 50 \times \cos 25°$	45.315389	45.3	$a = 45.3$
2			16	42°	*b*	$b = 16 \times \sin 42°$	10.70609	10.7	$b = 10.7$
3		9		23°	*c*	$c = 9 \times \tan 23°$	3.8202733	3.8	$c = 3.8$
4		22		31°	*d*	$d = 22 \times \tan 31°$	13.218934	13.2	$d = 13.2$
5			14	49°	*e*	$e = 14 \times \sin 49°$	10.565934	10.6	$e = 10.6$
6			25	37°	*f*	$f = 25 \times \cos 37°$	19.965888	20	$f = 20$
7			1.8	28°	*g*	$g = 1.8 \times \sin 28°$	0.8450488	0.8	$g = 0.8$
8			45	52°	*h*	$h = 45 \times \sin 52°$	35.460484	35.5	$h = 35.5$
9			4.2	65°	*i*	$i = 4.2 \times \cos 65°$	1.7749967	1.8	$i = 1.8$
10		6.8		48°	*j*	$j = 6.8 \times \tan 48°$	7.5521651	7.6	$j = 7.6$
11		21		75°	*k*	$k = 21 \times \tan 75°$	78.373067	78.4	$k = 78.4$
12			84	65°	*l*	$l = 84 \times \sin 65°$	76.129854	76.1	$l = 76.1$
13			24	35°	*m*	$m = 24 \times \sin 35°$	13.765834	13.8	$m = 13.8$
14		35		44°	*n*	$n = 35 \times \tan 44°$	33.799107	33.8	$n = 33.8$
15			2.2	72°	*p*	$p = 2.2 \times \sin 72°$	2.0923243	2.1	$p = 2.1$
16		120		37°	*q*	$q = 120 \times \tan 37°$	90.426486	90.4	$q = 90.4$
17		75		41°	*r*	$r = 75 \times \tan 41°$	65.196505	65.2	$r = 65.2$
18			90	80°	*s*	$s = 90 \times \sin 80°$	88.632698	88.6	$s = 88.6$
19			3.2	30°	*t*	$t = 3.2 \times \cos 30°$	2.7712813	2.8	$t = 2.8$
20			3.8	78°	*u*	$u = 3.8 \times \sin 78°$	3.7169609	3.7	$u = 3.7$

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Solutions sheet No. 89					Mixed Trig Ratio - Find a Side 2				
Working using $\sin A = \frac{O}{H}$ or $\cos A = \frac{A}{H}$ or $\tan A = \frac{O}{A}$									
No.	**Opp**	**Adj**	**Hyp**	**A**	**Side**	**Equation**	**Calculator**	**Rounded**	**Solution**
1			30	47°	*a*	$a = 30 \times \cos 47°$	20.459951	20.5	$a = 20.5$
2		140		37°	*b*	$b = 140 \times \tan 37°$	105.49757	105.5	$b = 105.5$
3			12	44°	*c*	$c = 12 \times \cos 44°$	8.6320776	8.6	$c = 8.6$
4			35	63°	*d*	$d = 35 \times \sin 63°$	31.185228	31.2	$d = 31.2$
5			10	33°	*e*	$e = 10 \times \sin 33°$	5.4463904	5.4	$e = 5.4$
6		85		57°	*f*	$f = 85 \times \tan 57°$	130.88852	130.9	$f = 130.9$
7			30	24°	*g*	$g = 30 \times \cos 24°$	27.406364	27.4	$g = 27.4$
8			40	41°	*h*	$h = 40 \times \sin 41°$	26.242361	26.2	$h = 26.2$
9		116		36°	*i*	$i = 116 \times \tan 36°$	84.278933	84.3	$i = 84.3$
10			18	56°	*j*	$j = 18 \times \sin 56°$	14.922676	14.9	$j = 14.9$
11			20	48°	*k*	$k = 20 \times \cos 48°$	13.382612	13.4	$k = 13.4$
12			175	42°	*l*	$l = 175 \times \cos 42°$	130.05034	130.1	$l = 130.1$
13		60		47°	*m*	$m = 60 \times \tan 47°$	64.342123	64.3	$m = 64.3$
14			78	19°	*n*	$n = 78 \times \sin 19°$	25.394316	25.4	$n = 25.4$
15			55	54°	*p*	$p = 55 \times \cos 54°$	32.328189	32.3	$p = 32.3$
16			12.5	42°	*q*	$q = 12.5 \times \sin 42°$	8.3641326	8.4	$q = 8.4$
17			2.7	56°	*r*	$r = 2.7 \times \cos 56°$	1.5098208	1.5	$r = 1.5$
18			4.8	62°	*s*	$s = 4.8 \times \sin 62°$	4.2381484	4.2	$s = 4.2$
19		8.8		75°	*t*	$t = 8.8 \times \tan 75°$	32.842047	32.8	$t = 32.8$
20			4.75	71°	*u*	$u = 4.75 \times \sin 71°$	4.4912132	4.5	$u = 4.5$

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Solutions sheet No. 90					**Mixed Trig Ratio - Find a Side 3**				
Working using $\sin A = \frac{O}{H}$ or $\cos A = \frac{A}{H}$ or $\tan A = \frac{O}{A}$									
No.	**Opp**	**Adj**	**Hyp**	**A**	**Side**	**Equation**	**Calculator**	**Rounded**	**Solution**
1		25		43°	*a*	$a = 25 \times \tan 43°$	23.312877	23.3	$a = 23.3$
2			150	67°	*b*	$b = 150 \times \sin 67°$	138.07573	138.1	$b = 138.1$
3		50		43°	*c*	$c = 50 \times \tan 43°$	46.625754	46.6	$c = 46.6$
4			90	48°	*d*	$d = 90 \times \cos 48°$	60.221755	60.2	$d = 60.2$
5			165	32°	*e*	$e = 165 \times \cos 32°$	139.92794	139.9	$e = 139.9$
6			18	20°	*f*	$f = 18 \times \cos 20°$	16.914467	16.9	$f = 16.9$
7			68	40°	*g*	$g = 68 \times \sin 40°$	43.709557	43.7	$g = 43.7$
8			140	48°	*h*	$h = 140 \times \sin 48°$	104.04028	104	$h = 104$
9			72	59°	*i*	$i = 72 \times \cos 59°$	37.082741	37.1	$i = 37.1$
10			7.5	22°	*j*	$j = 7.5 \times \cos 22°$	6.9538789	7	$j = 7$
11			185	42°	*k*	$k = 185 \times \sin 42°$	123.78916	123.8	$k = 123.8$
12			40	43°	*l*	$l = 40 \times \sin 43°$	27.279934	27.3	$l = 27.3$
13			215	63°	*m*	$m = 215 \times \cos 63°$	97.607957	97.6	$m = 97.6$
14			160	71°	*n*	$n = 160 \times \sin 71°$	151.28297	151.3	$n = 151.3$
15			25	51°	*p*	$p = 25 \times \cos 51°$	15.73301	15.7	$p = 15.7$
16		38		64°	*q*	$q = 38 \times \tan 64°$	77.911546	77.9	$q = 77.9$
17			8	55°	*r*	$r = 8 \times \sin 55°$	6.5532164	6.6	$r = 6.6$
18			4.2	62°	*s*	$s = 4.2 \times \cos 62°$	1.9717806	2	$s = 2$
19		150		32°	*t*	$t = 150 \times \tan 32°$	93.730403	93.7	$t = 93.7$
20			8.75	75°	*u*	$u = 8.75 \times \sin 75°$	8.451851	8.5	$u = 8.5$

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Solutions sheet No. 91					Mixed Trig Ratio - Find a Side 1 (Degrees & Minutes)				
Working using $\sin A = \frac{O}{H}$ or $\cos A = \frac{A}{H}$ or $\tan A = \frac{O}{A}$									
No.	**Opp**	**Adj**	**Hyp**	**A**	**Side**	**Equation**	**Calculator**	**Rounded**	**Solution**
1			20	48°30'	*a*	*a* = 20×cos48°30'	13.252401	13.3	*a* = 13.3
2		170		32°24'	*b*	*b* = 170×tan32°24'	107.88528	107.9	*b* = 107.9
3			35	42°36'	*c*	*c* = 35×cos42°36'	25.763398	25.8	*c* = 25.8
4			45	66°40'	*d*	*d* = 45×sin66°40'	41.319725	41.3	*d* = 41.3
5			100	34°26'	*e*	*e* = 100×sin34°26'	56.544694	56.5	*e* = 56.5
6		116		62°49'	*f*	*f* = 116×tan62°49'	225.87318	225.9	*f* = 225.9
7			19.8	21°31'	*g*	*g* = 19.8×cos21°31'	18.420156	18.4	*g* = 18.4
8			340	38°9'	*h*	*h* = 340×sin38°9'	210.02561	210	*h* = 210
9		116		40°55'	*i*	*i* = 116×tan40°55'	100.54143	100.5	*i* = 100.5
10			26	57°50'	*j*	*j* = 26×sin57°50'	22.009079	22	*j* = 22
11			70	46°52'	*k*	*k* = 70×cos46°52'	47.858891	47.9	*k* = 47.9
12			275	37°35'	*l*	*l* = 275×cos37°35'	217.92845	217.9	*l* = 217.9
13		40		53°48'	*m*	*m* = 40×tan53°48'	54.653069	54.7	*m* = 54.7
14			22.6	20°7'	*n*	*n* = 22.6×sin20°7'	7.7728824	7.8	*n* = 7.8
15			335	58°13'	*p*	*p* = 335×cos58°13'	176.44736	176.4	*p* = 176.4
16			120	48°50'	*q*	*q* = 120×sin48°50'	90.335759	90.3	*q* = 90.3
17			2.17	65°40'	*r*	*r* = 2.17×cos65°40'	0.8941366	0.9	*r* = 0.9
18			4.5	60°30'	*s*	*s* = 4.5×sin60°30'	3.9166006	3.9	*s* = 3.9
19		8.75		70°20'	*t*	*t* = 8.75×tan70°20'	24.482673	24.5	*t* = 24.5
20			2200	73°40'	*u*	*u* = 2200×sin73°40'	2111.2121	2111.2	*u* = 2111.2

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Solutions sheet No. 92					Mixed Trig Ratio - Find a Side 2 (Degrees & Minutes)				
Working using $\sin A = \frac{O}{H}$ or $\cos A = \frac{A}{H}$ or $\tan A = \frac{O}{A}$									
No.	**Opp**	**Adj**	**Hyp**	**A**	**Side**	**Equation**	**Calculator**	**Rounded**	**Solution**
1		40		40°50'	*a*	*a* = 40×tan40°50'	34.567704	34.6	*a* = 34.6
2			350	68°32'	*b*	*b* = 350×sin68°32'	325.72072	325.7	*b* = 325.7
3		50		41°36'	*c*	*c* = 50×tan41°36'	44.392077	44.4	*c* = 44.4
4			60	48°27'	*d*	*d* = 60×cos48°27'	39.796403	39.8	*d* = 39.8
5			87	26°44'	*e*	*e* = 87×cos26°44'	77.700556	77.7	*e* = 77.7
6			12.5	20°49'	*f*	*f* = 12.5×cos20°49'	11.684029	11.7	*f* = 11.7
7			26	38°52'	*g*	*g* = 26×sin38°52'	16.315265	16.3	*g* = 16.3
8			80	48°14'	*h*	*h* = 80×sin48°14'	59.669092	59.7	*h* = 59.7
9			75	58°46'	*i*	*i* = 75×cos58°46'	38.889341	38.9	*i* = 38.9
10			1750	22°47'	*j*	*j* = 1750×cos22°47'	1613.4577	1613.5	*j* = 1613.5
11			18.2	38°3'	*k*	*k* = 18.2×sin38°3'	11.21755	11.2	*k* = 11.2
12			3750	42°41'	*l*	*l* = 3750×sin42°41'	2542.297	2542.3	*l* = 2542.3
13			265	64°19'	*m*	*m* = 265×cos64°19'	114.85019	114.9	*m* = 114.9
14			17	73°36'	*n*	*n* = 17×sin73°36'	16.308338	16.3	*n* = 16.3
15			1	49°52'	*p*	*p* = 1×cos49°52'	0.6445685	0.6	*p* = 0.6
16		300		71°54'	*q*	*q* = 300×tan71°54'	917.85115	917.9	*q* = 917.9
17			35	60°38'	*r*	*r* = 35×sin60°38'	30.502474	30.5	*r* = 30.5
18			475	64°24'	*s*	*s* = 475×cos64°24'	205.24073	205.2	*s* = 205.2
19		150		33°20'	*t*	*t* = 150×tan33°20'	98.656552	98.7	*t* = 98.7
20			850	73°11'	*u*	*u* = 850×sin73°11'	813.65007	813.7	*u* = 813.7

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Solutions sheet No. 93				**Mixed Trig Ratio - Find an Angle 1**				
Working using $\sin A = \frac{O}{H}$ or $\cos A = \frac{A}{H}$ or $\tan A = \frac{O}{A}$								
No.	**Opp**	**Adj**	**Hyp**	**Angle**	**Equation**	**Calculator**	**Rounded**	**Solution**
1		8	10	*a*	cos*a* = 8/10	36.869898	37°	*a*° = 37°
2	13		25	*b*	sin*b* = 13/25	31.332251	31°	*b*° = 31°
3	45		72	*c*	sin*c* = 45/72	38.682187	39°	*c*° = 39°
4	8	9		*d*	tan*d* = 8/9	41.633539	42°	*d*° = 42°
5		34	58	*e*	cos*e* = 34/58	54.111702	54°	*e*° = 54°
6	48	36		*f*	tan*f* = 48/36	53.130102	53°	*f*° = 53°
7	48		64	*g*	sin*g* = 48/64	48.590378	49°	*g*° = 49°
8	50		92	*h*	sin*h* = 50/92	32.920735	33°	*h*° = 33°
9	33	21		*i*	tan*i* = 33/21	57.528808	58°	*i*° = 58°
10		26	38	*j*	cos*j* = 26/38	46.826449	47°	*j*° = 47°
11	12	6		*k*	tan*k* = 12/6	63.434949	63°	*k*° = 63°
12	18		38	*l*	sin*l* = 18/38	28.273714	28°	*l*° = 28°
13	95	80		*m*	tan*m* = 95/80	49.899092	50°	*m*° = 50°
14	210		250	*n*	sin*n* = 210/250	57.14012	57°	*n*° = 57°
15		40	85	*p*	cos*p* = 40/85	61.927513	62°	*p*° = 62°
16	22	15		*q*	tan*q* = 22/15	55.713123	56°	*q*° = 56°
17	325		400	*r*	sin*r* = 325/400	54.340912	54°	*r*° = 54°
18		60	92	*s*	cos*s* = 60/92	49.294293	49°	*s*° = 49°
19	7.6		10.3	*t*	sin*t* = 7.6/10.3	47.549784	48°	*t*° = 48°
20	10.9	1.3		*u*	tan*u* = 10.9/1.3	83.198685	83°	*u*° = 83°

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Solutions sheet No. 94				Mixed Trig Ratio - Find an Angle 2				
Working using $\sin A = \frac{O}{H}$ or $\cos A = \frac{A}{H}$ or $\tan A = \frac{O}{A}$								
No.	**Opp**	**Adj**	**Hyp**	**Angle**	**Equation**	**Calculator**	**Rounded**	**Solution**
1	25		35	*a*	sin*a* = 25/35	45.584691	46°	*a*° = 46°
2		42	60	*b*	cos*b* = 42/60	45.572996	46°	*b*° = 46°
3	43		60	*c*	sin*c* = 43/60	45.779956	46°	*c*° = 46°
4		2.9	5.6	*d*	cos*d* = 2.9/5.6	58.811378	59°	*d*° = 59°
5		16	28	*e*	cos*e* = 16/28	55.150095	55°	*e*° = 55°
6	15		17	*f*	sin*f* = 15/17	61.927513	62°	*f*° = 62°
7		91	120	*g*	cos*g* = 91/120	40.682512	41°	*g*° = 41°
8	32	60		*h*	tan*h* = 32/60	28.072487	28°	*h*° = 28°
9	25	33		*i*	tan*i* = 25/33	37.146687	37°	*i*° = 37°
10		66	94	*j*	cos*j* = 66/94	45.402043	45°	*j*° = 45°
11	68	74		*k*	tan*k* = 68/74	42.580491	43°	*k*° = 43°
12	12		19	*l*	sin*l* = 12/19	39.166711	39°	*l*° = 39°
13	125	60		*m*	tan*m* = 125/60	64.358994	64°	*m*° = 64°
14	200		275	*n*	sin*n* = 200/275	46.658242	47°	*n*° = 47°
15		6.2	9.4	*p*	cos*p* = 6.2/9.4	48.732573	49°	*p*° = 49°
16		3.9	5.7	*q*	cos*q* = 3.9/5.7	46.826449	47°	*q*° = 47°
17	7.9	5.5		*r*	tan*r* = 7.9/5.5	55.154267	55°	*r*° = 55°
18	26		41	*s*	sin*s* = 26/41	39.356699	39°	*s*° = 39°
19	23		35	*t*	sin*t* = 23/35	41.082333	41°	*t*° = 41°
20	300	180		*u*	tan*u* = 300/180	59.036243	59°	*u*° = 59°

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Solutions sheet No. 95				**Mixed Trig Ratio - Find an Angle DMS 1**				
Working using $\sin A = \frac{O}{H}$ or $\cos A = \frac{A}{H}$ or $\tan A = \frac{O}{A}$								
No.	**Opp**	**Adj**	**Hyp**	**Angle**	**Equation**	**Calculator**	**Converted**	**Solution**
1		17	20	*a*	cos*a* = 17/20	31.78833	31°47'	*a* = 31°47'
2	45		60	*b*	sin*b* = 45/60	48.59038	48°35'	*b* = 48°35'
3		30	50	*c*	cos*c* = 30/50	53.1301	53°8'	*c* = 53°8'
4	48	52		*d*	tan*d* = 48/52	42.70939	42°43'	*d* = 42°43'
5	25	15		*e*	tan*e* = 25/15	59.03624	59°2'	*e* = 59°2'
6		6	13	*f*	cos*f* = 6/13	62.51357	62°31'	*f* = 62°31'
7	60		75	*g*	sin*g* = 60/75	53.1301	53°8'	*g* = 53°8'
8		25	32	*h*	cos*h* = 25/32	38.62483	38°37'	*h* = 38°37'
9	21	32		*i*	tan*i* = 21/32	33.27489	33°16'	*i* = 33°16'
10	25		36	*j*	sin*j* = 25/36	43.98296	43°59'	*j* = 43°59'
11	33		48	*k*	sin*k* = 33/48	43.43254	43°26'	*k* = 43°26'
12	35	23		*l*	tan*l* = 35/23	56.68937	56°41'	*l* = 56°41'
13	125		175	*m*	sin*m* = 125/175	45.58469	45°35'	*m* = 45°35'
14		90	220	*n*	cos*n* = 90/220	65.85226	65°51'	*n* = 65°51'
15	110	88		*p*	tan*p* = 110/88	51.34019	51°20'	*p* = 51°20'
16		28	49	*q*	cos*q* = 28/49	55.1501	55°9'	*q* = 55°9'
17	9	6		*r*	tan*r* = 9/6	56.30993	56°19'	*r* = 56°19'
18		45	75	*s*	cos*s* = 45/75	53.1301	53°8'	*s* = 53°8'
19		1750	3000	*t*	cos*t* = 1750/3000	54.31467	54°19'	*t* = 54°19'
20	0.7		0.8	*u*	sin*u* = 0.7/0.8	61.04498	61°3'	*u* = 61°3'

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Solutions sheet No. 96				Mixed Trig Ratio - Find an Angle DMS 2				
Working using $\sin A = \frac{O}{H}$ or $\cos A = \frac{A}{H}$ or $\tan A = \frac{O}{A}$								
No.	**Opp**	**Adj**	**Hyp**	**Angle**	**Equation**	**Calculator**	**Rounded**	**Solution**
1	10	12		*a*	tan*a* = 10/12	39.80557	39°48'	*a* = 39°48'
2	50		65	*b*	sin*b* = 50/65	50.28486	50°17'	*b* = 50°17'
3	70	95		*c*	tan*c* = 70/95	36.38435	36°23'	*c* = 36°23'
4		20	34	*d*	cos*d* = 20/34	53.96812	53°58'	*d* = 53°58'
5	5		9	*e*	sin*e* = 5/9	33.74899	33°45'	*e* = 33°45'
6		7	12	*f*	cos*f* = 7/12	54.31467	54°19'	*f* = 54°19'
7	40		70	*g*	sin*g* = 40/70	34.8499	34°51'	*g* = 34°51'
8	35	23		*h*	tan*h* = 35/23	56.68937	56°41'	*h* = 56°41'
9	24		42	*i*	sin*i* = 24/42	34.8499	34°51'	*i* = 34°51'
10	32	22		*j*	tan*j* = 32/22	55.49148	55°29'	*j* = 55°29'
11		35	49	*k*	cos*k* = 35/49	44.41531	44°25'	*k* = 44°25'
12	26	25		*l*	tan*l* = 26/25	46.1233	46°7'	*l* = 46°7'
13		65	145	*m*	cos*m* = 65/145	63.36688	63°22'	*m* = 63°22'
14	80		105	*n*	sin*n* = 80/105	49.63241	49°38'	*n* = 49°38'
15		84	130	*p*	cos*p* = 84/130	49.74776	49°45'	*p* = 49°45'
16	30	16		*q*	tan*q* = 30/16	61.92751	61°56'	*q* = 61°56'
17	15		22	*r*	sin*r* = 15/22	42.98589	42°59'	*r* = 42°59'
18	7.5		9.5	*s*	sin*s* = 7.5/9.5	52.13635	52°8'	*s* = 52°8'
19	2.3		4.1	*t*	sin*t* = 2.3/4.1	34.12329	34°7'	*t* = 34°7'
20		625	1000	*u*	cos*u* = 625/1000	51.31781	51°19'	*u* = 51°19'

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Solutions sheet No. 97	Division by Trigonometric Functions		
1) $\frac{1}{\cos 28°} = 1.133$	11) $\frac{17}{\sin 11°} = 89.094$	21) $\frac{35}{\tan 85°} = 3.062$	31) $\frac{31}{13\cos 36°} = 2.948$
2) $\frac{1}{\tan 59°} = 0.601$	12) $\frac{15}{\sin 69°} = 46.073$	22) $\frac{11}{\sin 25°} = 26.028$	32) $\frac{11}{13\sin 41°} = 1.290$
3) $\frac{1}{\tan 51°} = 0.810$	13) $\frac{15}{\cos 61°} = 30.940$	23) $\frac{28}{\tan 24°} = 62.889$	33) $\frac{32}{11\sin 52°} = 3.692$
4) $\frac{1}{\sin 37°} = 1.662$	14) $\frac{6}{\sin 69°} = 6.427$	24) $\frac{23}{\tan 11°} = 118.325$	34) $\frac{14}{13\sin 37°} = 1.789$
5) $\frac{1}{\sin 73°}$ 1.046	15) $\frac{14}{\sin 70°}$ 14.898	25) $\frac{10}{\tan 61°}$ 5.543	35) $\frac{9}{12\tan 36°}$ 1.032
6) $\frac{1}{\sin 80°} = 1.015$	16) $\frac{5}{\tan 45°} = 5.000$	26) $\frac{5}{\sin 73°} = 5.228$	36) $\frac{16}{4\sin 47°} = 5.469$
7) $\frac{1}{\tan 71°} = 0.344$	17) $\frac{13}{\sin 22°} = 34.703$	27) $\frac{16}{\sin 49°} = 21.200$	37) $\frac{23}{8\tan 25°} = 6.165$
8) $\frac{1}{\cos 61°} = 2.063$	18) $\frac{2}{\tan 53°} = 1.507$	28) $\frac{29}{\tan 36°} = 39.915$	38) $\frac{25}{13\tan 36°} = 2.647$
9) $\frac{1}{\cos 37°} = 1.252$	19) $\frac{2}{\cos 66°} = 4.917$	29) $\frac{9}{\tan 35°} = 12.853$	39) $\frac{18}{8\sin 74°} = 2.341$
10) $\frac{1}{\tan 21°} = 2.605$	20) $\frac{5}{\sin 41°} = 7.621$	30) $\frac{19}{\cos 63°} = 41.851$	40) $\frac{11}{4\tan 69°} = 1.056$

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Solutions sheet No. 98				Reciprocal Sine Ratio - Find an Side 1				
Working using $\sin A = \frac{O}{H}$ or $H = \frac{O}{\sin A}$								
No.	**Opp**	**Adj**	**Hyp**	**Angle**	**Equation**	**Calculator**	**Rounded**	**Solution**
1	12		*a*	32°	*a* = 12/sin32°	22.644959	22.6	*a* = 22.6
2	80		*b*	38°	*b* = 80/sin38°	129.94154	129.9	*b* = 129.9
3	18		*c*	36°	*c* = 18/sin36°	30.623429	30.6	*c* = 30.6
4	47		*d*	47°	*d* = 47/sin47°	64.264391	64.3	*d* = 64.3
5	30		*e*	41°	*e* = 30/sin41°	45.727593	45.7	*e* = 45.7
6	250		*f*	38°	*f* = 250/sin38°	406.06731	406.1	*f* = 406.1
7	4.5		*g*	26°	*g* = 4.5/sin26°	10.265274	10.3	*g* = 10.3
8	8.2		*h*	64°	*h* = 8.2/sin64°	9.1233359	9.1	*h* = 9.1
9	11		*i*	21°	*i* = 11/sin21°	30.694709	30.7	*i* = 30.7
10	3.2		*j*	65°	*j* = 3.2/sin65°	3.5308093	3.5	*j* = 3.5
11	225		*k*	56°	*k* = 225/sin56°	271.39904	271.4	*k* = 271.4
12	90		*l*	43°	*l* = 90/sin43°	131.96513	132	*l* = 132
13	45		*m*	37°	*m* = 45/sin37°	74.773806	74.8	*m* = 74.8
14	65		*n*	43°	*n* = 65/sin43°	95.308147	95.3	*n* = 95.3
15	7.25		*p*	74°	*p* = 7.25/sin74°	7.5421709	7.5	*p* = 7.5
16	16.7		*q*	72°	*q* = 16.7/sin72°	17.559419	17.6	*q* = 17.6
17	26		*r*	68°	*r* = 26/sin68°	28.041903	28	*r* = 28
18	50		*s*	66°	*s* = 50/sin66°	54.731814	54.7	*s* = 54.7
19	300		*t*	58°	*t* = 300/sin58°	353.75352	353.8	*t* = 353.8
20	11.5		*u*	53°	*u* = 11.5/sin53°	14.39956	14.4	*u* = 14.4

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Solutions sheet No. 99	Reciprocal Cosine Ratio - Find a Side 1

Working using $\cos A = \frac{A}{H}$ or $H = \frac{O}{\cos A}$

No.	Working							Solution
	Opp	Adj	Hyp	Angle	Equation	Calculator	1 Dec. Place	
1		50	*a*	40°	*a* = 50/cos40°	65.270364	65.3	*a* = 65.3
2		15	*b*	43°	*b* = 15/cos43°	20.509912	20.5	*b* = 20.5
3		60	*c*	35°	*c* = 60/cos35°	73.246475	73.2	*c* = 73.2
4		6	*d*	36°	*d* = 6/cos36°	7.4164079	7.4	*d* = 7.4
5		12	*e*	60°	*e* = 12/cos60°	24	24	*e* = 24
6		16.5	*f*	47°	*f* = 16.5/cos47°	24.193607	24.2	*f* = 24.2
7		25	*g*	38°	*g* = 25/cos38°	31.725455	31.7	*g* = 31.7
8		90	*h*	20°	*h* = 90/cos20°	95.776	95.8	*h* = 95.8
9		8.25	*i*	46°	*i* = 8.25/cos46°	11.876341	11.9	*i* = 11.9
10		14.75	*j*	27°	*j* = 14.75/cos27°	16.554312	16.6	*j* = 16.6
11		130	*k*	69°	*k* = 130/cos69°	362.75565	362.8	*k* = 362.8
12		34	*l*	37°	*l* = 34/cos37°	42.572612	42.6	*l* = 42.6
13		500	*m*	47°	*m* = 500/cos47°	733.13959	733.1	*m* = 733.1
14		72	*n*	63°	*n* = 72/cos63°	158.59363	158.6	*n* = 158.6
15		7.6	*p*	74°	*p* = 7.6/cos74°	27.57246	27.6	*p* = 27.6
16		22	*q*	64°	*q* = 22/cos64°	50.185785	50.2	*q* = 50.2
17		75	*r*	81°	*r* = 75/cos81°	479.43399	479.4	*r* = 479.4
18		3.1	*s*	48°	*s* = 3.1/cos48°	4.6328773	4.6	*s* = 4.6
19		36	*t*	58°	*t* = 36/cos58°	67.934877	67.9	*t* = 67.9
20		0.95	*u*	55°	*u* = 0.95/cos55°	1.6562745	1.7	*u* = 1.7

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Solutions sheet No. 100				Reciprocal Tangent Ratio - Find a Side 1				
Working using $\tan A = \frac{O}{A}$ or $A = \frac{O}{\tan A}$								
No.	**Opp**	**Adj**	**Hyp**	**Angle**	**Equation**	**Calculator**	**1 Dec. Place**	**Solution**
1	100	*a*		66°	*a* = 100/tan66°	44.5	65.3	*a* = 44.5
2	60	*b*		63°	*b* = 60/tan63°	30.6	20.5	*b* = 30.6
3	25	*c*		40°	*c* = 25/tan40°	29.8	73.2	*c* = 29.8
4	15	*d*		42°	*d* = 15/tan42°	16.7	7.4	*d* = 16.7
5	80	*e*		36°	*e* = 80/tan36°	110.1	24	*e* = 110.1
6	13.5	*f*		32°	*f* = 13.5/tan32°	21.6	24.2	*f* = 21.6
7	32	*g*		37°	*g* = 32/tan37°	42.5	31.7	*g* = 42.5
8	65	*h*		42°	*h* = 65/tan42°	72.2	95.8	*h* = 72.2
9	75	*i*		40°	*i* = 75/tan40°	89.4	11.9	*i* = 89.4
10	9	*j*		26°	*j* = 9/tan26°	18.5	16.6	*j* = 18.5
11	40	*k*		25°	*k* = 40/tan25°	85.8	362.8	*k* = 85.8
12	32.5	*l*		44°	*l* = 32.5/tan44°	33.7	42.6	*l* = 33.7
13	17.5	*m*		20°	*m* = 17.5/tan20°	48.1	733.1	*m* = 48.1
14	140	*n*		29°	*n* = 140/tan29°	252.6	158.6	*n* = 252.6
15	6.8	*p*		46°	*p* = 6.8/tan46°	6.6	27.6	*p* = 6.6
16	220	*q*		58°	*q* = 220/tan58°	137.5	50.2	*q* = 137.5
17	4.8	*r*		53°	*r* = 4.8/tan53°	3.6	479.4	*r* = 3.6
18	325	*s*		47°	*s* = 325/tan47°	303.1	4.6	*s* = 303.1
19	6.75	*t*		59°	*t* = 6.75/tan59°	4.1	67.9	*t* = 4.1
20	61	*u*		34°	*u* = 61/tan34°	90.4	1.7	*u* = 90.4

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Solutions sheet No. 101				Reciprocal Sine Ratio - Find an Side 1 (degrees & minutes)				
Working using $\sin A = \frac{O}{H}$ or $H = \frac{O}{\sin A}$								
No.	**Opp**	**Adj**	**Hyp**	**Angle**	**Equation**	**Calculator**	**Rounded**	**Solution**
1	600	*a*		37°32'	*a* = 600/sin37°32'	984.86124	984.9	*a* = 984.9
2	35	*b*		35°41'	*b* = 35/sin35°41'	60.002918	60	*b* = 60
3	62	*c*		22°47'	*c* = 62/sin22°47'	160.10436	160.1	*c* = 160.1
4	750	*d*		48°16'	*d* = 750/sin48°16'	1005.0237	1005	*d* = 1005
5	18	*e*		31°50'	*e* = 18/sin31°50'	34.126448	34.1	*e* = 34.1
6	350	*f*		37°45'	*f* = 350/sin37°45'	571.69246	571.7	*f* = 571.7
7	480	*g*		25°39'	*g* = 480/sin25°39'	1108.8713	1108.9	*g* = 1108.9
8	8.25	*h*		68°40'	*h* = 8.25/sin68°40'	8.8568754	8.9	*h* = 8.9
9	900	*i*		41°50'	*i* = 900/sin41°50'	1349.394	1349.4	*i* = 1349.4
10	45	*j*		64°14'	*j* = 45/sin64°14'	49.968252	50	*j* = 50
11	280	*k*		59°55'	*k* = 280/sin59°55'	323.58822	323.6	*k* = 323.6
12	950	*l*		68°5'	*l* = 950/sin68°5'	1024.0073	1024	*l* = 1024
13	250	*m*		38°57'	*m* = 250/sin38°57'	397.68265	397.7	*m* = 397.7
14	65	*n*		48°28'	*n* = 65/sin48°28'	86.832215	86.8	*n* = 86.8
15	205	*p*		34°35'	*p* = 205/sin34°35'	361.16711	361.2	*p* = 361.2
16	1525	*q*		73°35'	*q* = 1525/sin73°35'	1589.8138	1589.8	*q* = 1589.8
17	1500	*r*		54°13'	*r* = 1500/sin54°13'	1849.0351	1849	*r* = 1849
18	6000	*s*		70°14'	*s* = 6000/sin70°14'	6375.6692	6375.7	*s* = 6375.7
19	75	*t*		61°17'	*t* = 75/sin61°17'	85.518187	85.5	*t* = 85.5
20	345	*u*		63°24'	*u* = 345/sin63°24'	385.83947	385.8	*u* = 385.8

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Solutions sheet No. 102	Reciprocal Cos Ratio - Find an Side 1 (degrees & minutes)

Working using $\cos A = \frac{A}{H}$ or $H = \frac{O}{\cos A}$

No.	Working							Solution
	Opp	Adj	Hyp	Angle	Equation	Calculator	1 Dec. Place	
1		50	*a*	52°19'	*a* = 50/cos52°19'	81.793321	81.8	*a* = 81.8
2		65	*b*	42°37'	*b* = 65/cos42°37'	88.327199	88.3	*b* = 88.3
3		200	*c*	32°56'	*c* = 200/cos32°56'	238.29276	238.3	*c* = 238.3
4		6	*d*	38°34'	*d* = 6/cos38°34'	7.6737795	7.7	*d* = 7.7
5		75	*e*	66°7'	*e* = 75/cos66°7'	185.24207	185.2	*e* = 185.2
6		120	*f*	67°17'	*f* = 120/cos67°17'	310.74045	310.7	*f* = 310.7
7		325	*g*	36°46'	*g* = 325/cos36°46'	405.70244	405.7	*g* = 405.7
8		16.3	*h*	58°12'	*h* = 16.25/cos58°12'	30.837501	30.8	*h* = 30.8
9		85	*i*	47°20'	*i* = 85/cos47°20'	125.41831	125.4	*i* = 125.4
10		35	*j*	77°50'	*j* = 35/cos77°50'	166.06872	166.1	*j* = 166.1
11		70	*k*	39°53'	*k* = 70/cos39°53'	91.222837	91.2	*k* = 91.2
12		260	*l*	37°31'	*l* = 260/cos37°31'	327.79601	327.8	*l* = 327.8
13		180	*m*	52°18'	*m* = 180/cos52°18'	294.34512	294.3	*m* = 294.3
14		1100	*n*	17°49'	*n* = 1100/cos17°49'	1155.4131	1155.4	*n* = 1155.4
15		600	*p*	25°24'	*p* = 600/cos25°24'	664.2052	664.2	*p* = 664.2
16		32.5	*q*	61°51'	*q* = 32.5/cos61°51'	68.887822	68.9	*q* = 68.9
17		7.6	*r*	76°40'	*r* = 7.6/cos76°40'	32.955234	33	*r* = 33
18		16.8	*s*	50°21'	*s* = 16.8/cos50°21'	26.328321	26.3	*s* = 26.3
19		400	*t*	59°8'	*t* = 400/cos59°8'	779.66332	779.7	*t* = 779.7
20		215	*u*	64°16'	*u* = 215/cos64°16'	495.18264	495.2	*u* = 495.2

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Solutions sheet No. 103				Reciprocal Tangent Ratio - Find a Side 1 (degrees & minutes)				
Working using $\tan A = \frac{O}{A}$ or $A = \frac{O}{\tan A}$								
No.	**Opp**	**Adj**	**Hyp**	**Angle**	**Equation**	**Calculator**	**1 Dec. Place**	**Solution**
1	25	*a*		43°12'	= 25/tan43°12'	26.622296	26.6	*a* = 26.6
2	60	*b*		67°25'	= 60/tan67°25'	24.955114	25	*b* = 25
3	90	*c*		64°30'	= 90/tan64°30'	42.927798	42.9	*c* = 42.9
4	75	*d*		40°50'	= 75/tan40°50'	86.78621	86.8	*d* = 86.8
5	200	*e*		32°40'	= 200/tan32°40'	311.93105	311.9	*e* = 311.9
6	160	*f*		35°48'	= 160/tan35°48'	221.84547	221.8	*f* = 221.8
7	325	*g*		46°24'	= 325/tan46°24'	309.49332	309.5	*g* = 309.5
8	800	*h*		44°38'	= 800/tan44°38'	810.30536	810.3	*h* = 810.3
9	300	*i*		43°52'	= 300/tan43°52'	312.10935	312.1	*i* = 312.1
10	60	*j*		33°48'	= 60/tan33°48'	89.62693	89.6	*j* = 89.6
11	450	*k*		22°8'	= 450/tan22°8'	1106.3694	1106.4	*k* = 1106.4
12	220	*l*		64°16'	= 220/tan64°16'	106.03653	106	*l* = 106
13	250	*m*		23°49'	= 250/tan23°49'	566.37961	566.4	*m* = 566.4
14	1200	*n*		27°22'	= 1200/tan27°22'	2318.3348	2318.3	*n* = 2318.3
15	300	*p*		46°37'	= 300/tan46°37'	283.53064	283.5	*p* = 283.5
16	105	*q*		26°43'	= 105/tan26°43'	208.61806	208.6	*q* = 208.6
17	4.8	*r*		51°15'	= 4.8/tan51°15'	3.8524073	3.9	*r* = 3.9
18	300	*s*		36°47'	= 300/tan36°47'	401.26157	401.3	*s* = 401.3
19	675	*t*		60°51'	= 675/tan60°51'	376.47209	376.5	*t* = 376.5
20	5000	*u*		48°31'	= 5000/tan48°31'	4421.0341	4421	*u* = 4421

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Solutions sheet No. 104	Mixed Reciprocal Trig Ratio - Find a Side 1

Working using $H = \frac{O}{\sin A}$ or $H = \frac{O}{\cos A}$ or $A = \frac{O}{\tan A}$

No.	Opp	Adj	Hyp	Angle	Equation	Calculator	1 Dec. Place	Solution
1		10	*a*	28°	*a* = 10/cos28°	11.325701	11.3	*a* = 11.3
2	20		*b*	42°	*b* = 20/sin42°	29.889531	29.9	*b* = 29.9
3	8	*c*		51°	*c* = 8/tan51°	6.4782723	6.5	*c* = 6.5
4	7		*d*	38°	*d* = 7/sin38°	11.369885	11.4	*d* = 11.4
5	35	*e*		53°	*e* = 35/tan53°	26.374392	26.4	*e* = 26.4
6	2.7		*f*	70°	*f* = 2.7/sin70°	2.87328	2.9	*f* = 2.9
7	110	*g*		25°	*g* = 2.7/tan25°	5.7901687	5.8	*g* = 5.8
8	6.5	*h*		78°	*h* = 110/tan78°	23.381222	23.4	*h* = 23.4
9		11	*i*	43°	*i* = 11/cos43°	15.040602	15	*i* = 15
10		120	*j*	60°	*j* = 120/cos60°	240	240	*j* = 240
11	6.2		*k*	47°	*k* = 6.2/sin47°	8.4774303	8.5	*k* = 8.5
12	5	*l*		49°	*l* = 5/tan49°	4.3464337	4.3	*l* = 4.3
13	16		*m*	75°	*m* = 16/sin75°	16.564419	16.6	*m* = 16.6
14	61	*n*		18°	*n* = 61/tan18°	187.7387	187.7	*n* = 187.7
15		6.2	*p*	54°	*p* = 6.2/cos54°	10.54807	10.5	*p* = 10.5
16	8		*q*	30°	*q* = 8/sin30°	16	16	*q* = 16
17		7.5	*r*	47°	*r* = 7.5/cos47°	10.997094	11	*r* = 11
18	32		*s*	62°	*s* = 32/sin62°	36.242242	36.2	*s* = 36.2
19	2.75	*t*		77°	*t* = 2.75/tan77°	0.6348875	0.6	*t* = 0.6
20	21.3		*u*	47°	*u* = 21.3/sin47°	29.124075	29.1	*u* = 29.1

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Solutions sheet No. 105				Mixed Reciprocal Trig Ratio - Find a Side 1 (degrees & minutes)				
Working using $H = \frac{O}{\sin A}$ or $H = \frac{O}{\cos A}$ or $A = \frac{O}{\tan A}$								
No.	**Opp**	**Adj**	**Hyp**	**Angle**	**Equation**	**Calculator**	**1 Dec. Place**	**Solution**
1	20	*a*		20°30'	= 20/tan20°30'	53.49243	53.5	*a* = 53.5
2	200		*b*	75°45'	= 200/sin75°45'	206.34918	206.3	*b* = 206.3
3	70	*c*		58°45'	= 70/tan58°45'	42.477043	42.5	*c* = 42.5
4	50	*d*		62°3'	= 50/tan62°3'	26.529529	26.5	*d* = 26.5
5		120	*e*	23°48'	= 120/cos23°48'	131.15332	131.2	*e* = 131.2
6	65		*f*	48°50'	= 65/sin48°50'	86.344545	86.3	*f* = 86.3
7	650	*g*		48°34'	= 65/tan48°34'	57.372451	57.4	*g* = 57.4
8		300	*h*	36°4'	= 300/cos36°4'	371.13439	371.1	*h* = 371.1
9	60	*i*		72°15'	= 60/tan72°15'	19.206151	19.2	*i* = 19.2
10		180	*j*	63°18'	= 180/cos63°18'	400.60625	400.6	*j* = 400.6
11	70		*k*	39°46'	= 70/sin39°46'	109.43269	109.4	*k* = 109.4
12		150	*l*	44°58'	= 150/cos44°58'	212.00873	212	*l* = 212
13	21.3		*m*	50°25'	= 21.3/sin50°25'	27.637262	27.6	*m* = 27.6
14	66	*n*		16°50'	= 66/tan16°50'	218.1438	218.1	*n* = 218.1
15	525		*p*	73°9'	= 525/sin73°9'	548.55099	548.6	*p* = 548.6
16		500	*q*	40°40'	= 500/cos40°40'	659.18398	659.2	*q* = 659.2
17	85		*r*	26°40'	= 85/sin26°40'	189.39429	189.4	*r* = 189.4
18	340		*s*	68°47'	= 340/sin68°47'	364.72133	364.7	*s* = 364.7
19	250		*t*	35°49'	= 250/sin35°49'	427.20906	427.2	*t* = 427.2
20	2400	*u*		80°15'	= 2400/tan80°15'	412.39542	412.4	*u* = 412.4

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Solutions sheet No. 106				Mixed Reciprocal Trig Ratio - Find a Side 2 (degrees & minutes)				
Working using $H = \frac{O}{\sin A}$ or $H = \frac{O}{\cos A}$ or $A = \frac{O}{\tan A}$								
No.	**Opp**	**Adj**	**Hyp**	**Angle**	**Equation**	**Calculator**	**1 Dec. Place**	**Solution**
1	60		*a*	47°40'	*a* = 60/sin47°40'	81.164502	81.2	*a* = 81.2
2	500		*b*	76°40'	*b* = 500/sin76°40'	513.85092	513.9	*b* = 513.9
3	90	*c*		54°25'	*c* = 90/tan54°25'	64.394081	64.4	*c* = 64.4
4		140	*d*	67°31'	*d* = 140/cos67°31'	366.09474	366.1	*d* = 366.1
5		170	*e*	21°51'	*e* = 170/cos21°51'	183.1578	183.2	*e* = 183.2
6		180	*f*	37°52'	*f* = 180/cos37°52'	228.00934	228	*f* = 228
7	175		*g*	78°15'	*g* = 175/sin78°15'	178.74553	178.7	*g* = 178.7
8		5.7	*h*	39°34'	*h* = 5.7/cos39°34'	7.3941091	7.4	*h* = 7.4
9	85	*i*		17°43'	*i* = 85/tan17°43'	266.07295	266.1	*i* = 266.1
10	800	*j*		70°48'	*j* = 800/tan70°48'	278.58948	278.6	*j* = 278.6
11	150		*k*	43°21'	*k* = 150/sin43°21'	218.51453	218.5	*k* = 218.5
12	1250		*l*	64°27'	*l* = 1250/sin64°27'	1385.4879	1385.5	*l* = 1385.5
13	195		*m*	58°26'	*m* = 195/sin58°26'	228.86474	228.9	*m* = 228.9
14	450	*n*		63°35'	*n* = 450/tan63°35'	223.54512	223.5	*n* = 223.5
15	240	*p*		22°32'	*p* = 240/tan22°32'	578.45916	578.5	*p* = 578.5
16		1200	*q*	36°30'	*q* = 1200/cos36°30'	1492.8031	1492.8	*q* = 1492.8
17	200	*r*		77°21'	*r* = 200/tan77°21'	44.888586	44.9	*r* = 44.9
18	125		*s*	24°50'	*s* = 125/sin24°50'	297.63312	297.6	*s* = 297.6
19	700		*t*	33°41'	*t* = 700/sin33°41'	1262.1655	1262.2	*t* = 1262.2
20	750	*u*		47°24'	*u* = 750/tan47°24'	81.164502	81.2	*u* = 689.7

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Solutions sheet No. 107				Mixed Trig Ratio and Reciprocal Ratio - Find a Side 1				
Working using $H = \frac{O}{\sin A}$ or $H = \frac{O}{\cos A}$ or $A = \frac{O}{\tan A}$ or $\sin A = \frac{O}{H}$ or $\cos A = \frac{A}{H}$ or $\tan A = \frac{O}{A}$								
No.	**Opp**	**Adj**	**Hyp**	**Angle**	**Equation**	**Calculator**	**1 Dec. Place**	**Solution**
1	*a*		50	60°	$a = 50 \times \sin 60°$	43.30127	43.3	$a = 43.3$
2		25	*b*	28°	$b = 25/\cos 28°$	28.314251	28.3	$b = 28.3$
3	*c*	28		42°	$c = 28 \times \tan 42°$	25.211313	25.2	$c = 25.2$
4	32	*d*		52°	$d = 32/\tan 52°$	25.00114	25	$d = 25$
5		55	*e*	23°	$e = 55/\cos 23°$	59.749821	59.7	$e = 59.7$
6	*f*		27	74°	$f = 27 \times \sin 74°$	25.954066	26	$f = 26$
7	*g*	3.5		36°	$g = 3.5 \times \tan 36°$	2.5428988	2.5	$g = 2.5$
8	*h*	245		26°	$h = 245 \times \tan 26°$	119.49448	119.5	$h = 119.5$
9	6.8		*i*	49°	$i = 6.8/\sin 49°$	9.0100884	9	$i = 9$
10	80		*j*	71°	$j = 80/\sin 71°$	84.609654	84.6	$j = 84.6$
11	*k*		75	43°	$k = 75 \times \sin 43°$	51.149877	51.1	$k = 51.1$
12	*l*	0.7		40°	$l = 0.7 \times \tan 40°$	0.5873697	0.6	$l = 0.6$
13		*m*	21	34°	$m = 21 \times \cos 34°$	17.409789	17.4	$m = 17.4$
14	*n*		3.35	68°	$n = 3.35 \times \sin 68°$	3.1060659	3.1	$n = 3.1$
15	*p*	21		56°	$p = 21 \times \tan 56°$	31.13378	31.1	$p = 31.1$
16		115	*q*	57°	$q = 115/\cos 57°$	211.14902	211.1	$q = 211.1$
17		*2*	*r*	82°	$r = 2/\cos 82°$	14.370593	14.4	$r = 14.4$
18	3.8		*s*	66°	$s = 3.8/\sin 66°$	4.1596179	4.2	$s = 4.2$
19		29	*t*	44°	$t = 29/\cos 44°$	40.314744	40.3	$t = 40.3$
20	*u*		12.5	52°	$u = 12.5 \times \sin 52°$	9.8501344	9.9	$u = 9.9$

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Solutions sheet No. 108				Mixed Trig Ratio and Reciprocal Ratio - Find a Side 2				
Working using $H = \frac{O}{\sin A}$ or $H = \frac{O}{\cos A}$ or $A = \frac{O}{\tan A}$ or $\sin A = \frac{O}{H}$ or $\cos A = \frac{A}{H}$ or $\tan A = \frac{O}{A}$								
No.	**Opp**	**Adj**	**Hyp**	**Angle**	**Equation**	**Calculator**	**1 Dec. Place**	**Solution**
1	27		*a*	77°	*a* = 27/sin77°	27.710211	27.7	*a* = 27.7
2		20	*b*	24°	*b* = 20/cos24°	21.892726	21.9	*b* = 21.9
3	60	*c*		43°	*c* = 60/tan43°	64.342123	64.3	*c* = 64.3
4	*d*	48		56°	*d* = 48×tan56°	71.162926	71.2	*d* = 71.2
5		95	*e*	24°	*e* = 95/cos24°	103.99045	104	*e* = 104
6	325		*f*	64°	*f* = 325/sin64°	361.59563	361.6	*f* = 361.6
7	*g*	230		21°	*g* = 230×tan21°	88.288728	88.3	*g* = 88.3
8		32	*h*	36°	*h* = 32/cos36°	39.554175	39.6	*h* = 39.6
9		6.8	*i*	46°	*i* = 6.8/cos46°	9.7889845	9.8	*i* = 9.8
10	80	*j*		71°	*j* = 80/tan71°	27.546209	27.5	*j* = 27.5
11	*k*		160	44°	*k* = 160×sin44°	111.14534	111.1	*k* = 111.1
12		0.7	*l*	42°	*l* = 0.7/cos42°	0.9419429	0.9	*l* = 0.9
13		70	*m*	37°	*m* = 70/cos37°	87.649496	87.6	*m* = 87.6
14	*n*	*28*		62°	*n* = 28×tan62°	52.660341	52.7	*n* = 52.7
15	51		*p*	67°	*p* = 51/sin67°	55.404379	55.4	*p* = 55.4
16	*q*	115		66°	*q* = 115×tan66°	258.29423	258.3	*q* = 258.3
17	2		*r*	84°	*r* = 2/sin84°	2.0110166	2	*r* = 2
18	*s*		6.4	68°	*s* = 6.4×sin68°	5.9339767	5.9	*s* = 5.9
19		290	*t*	43°	*t* = 290/cos43°	396.52496	396.5	*t* = 396.5
20	24.6		*u*	65°	*u* = 24.6/sin65°	27.143097	27.1	*u* = 27.1

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Solutions sheet No. 109				Mixed Trig Ratio and Reciprocal Ratio - Find a Side 1 (DMS)				
Working using $H = \frac{O}{\sin A}$ or $H = \frac{O}{\cos A}$ or $A = \frac{O}{\tan A}$ or $\sin A = \frac{O}{H}$ or $\cos A = \frac{A}{H}$ or $\tan A = \frac{O}{A}$								
No.	**Opp**	**Adj**	**Hyp**	**Angle**	**Equation**	**Calculator**	**1 Dec. Place**	**Solution**
1		30	a	23°30'	$a = 30/\cos 23°30'$	32.713233	32.7	$a = 32.7$
2	b		75	76°45'	$b = 75 \times \sin 76°45'$	73.003444	73	$b = 73$
3	35	c		62°20'	$c = 35/\tan 62°20'$	18.349444	18.3	$c = 18.3$
4	d	24		43°12'	$d = 24 \times \tan 43°12'$	22.5375	22.5	$d = 22.5$
5	e		155	44°8'	$e = 155 \times \sin 44°8'$	107.93122	107.9	$e = 107.9$
6	f	5.6		38°46'	$f = 5.6 \times \tan 38°46'$	4.4971541	4.5	$f = 4.5$
7	g		60	64°53'	$g = 60 \times \sin 64°53'$	54.326722	54.3	$g = 54.3$
8	h	2000		18°52'	$h = 2000 \times \tan 18°52'$	683.45336	683.5	$h = 683.5$
9	65		i	46°29'	$i = 65/\sin 46°29'$	89.633647	89.6	$i = 89.6$
10	820		j	68°35'	$j = 820/\sin 68°35'$	880.82101	880.8	$j = 880.8$
11		45	k	20°23'	$k = 45/\cos 20°23'$	48.005973	48	$k = 48$
12	l	0.7		41°37'	$l = 0.7 \times \tan 41°37'$	0.6218533	0.6	$l = 0.6$
13		m	270	28°42'	$m = 270 \times \cos 28°42'$	236.82946	236.8	$m = 236.8$
14	n		15.3	61°16'	$n = 15.25 \times \sin 61°16'$	13.372216	13.4	$n = 13.4$
15	p	13		67°7'	$p = 13 \times \tan 67°7'$	30.800302	30.8	$p = 30.8$
16	35		q	69°6'	$q = 35/\sin 69°6'$	37.465031	37.5	$q = 37.5$
17		150	r	65°20'	$r = 150/\cos 65°20'$	359.42051	359.4	$r = 359.4$
18		24	s	83°22'	$s = 24/\cos 83°22'$	207.76513	207.8	$s = 207.8$
19		275	t	46°50'	$t = 275/\cos 46°50'$	401.97456	402	$t = 402$
20	u		1200	66°41'	$u = 1200 \times \sin 66°41'$	1101.9975	1102	$u = 1102$

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Solutions sheet No. 110				Mixed Trig Ratio and Reciprocal Ratio - Find a Side 2 (DMS)				
Working using $H = \frac{O}{\sin A}$ or $H = \frac{O}{\cos A}$ or $A = \frac{O}{\tan A}$ or $\sin A = \frac{O}{H}$ or $\cos A = \frac{A}{H}$ or $\tan A = \frac{O}{A}$								
No.	**Opp**	**Adj**	**Hyp**	**Angle**	**Equation**	**Calculator**	**1 Dec. Place**	**Solution**
1	*a*	60		17°20'	*a* = 60×tan17°20'	18.726219	18.7	*a* = 18.7
2	42	*b*		42°39'	*b* = 42/tan42°39'	45.594735	45.6	*b* = 45.6
3	325		*c*	67°59'	*c* = 325/sin67°59'	350.56501	350.6	*c* = 350.6
4	*d*	80		64°40'	*d* = 80×tan64°40'	168.98678	169	*d* = 169
5		360	*e*	25°15'	*e* = 360/cos25°15'	398.02969	398	*e* = 398
6	*f*		66	78°26'	*f* = 66×sin78°26'	64.659676	64.7	*f* = 64.7
7		20	*g*	28°51'	*g* = 20/cos28°51'	22.834023	22.8	*g* = 22.8
8		25	*h*	38°47'	*h* = 25/cos38°47'	32.07101	32.1	*h* = 32.1
9	70	*i*		68°22'	*i* = 70/tan68°22'	27.76208	27.8	*i* = 27.8
10		13.5	*j*	47°24'	*j* = 13.5/cos47°24'	19.94457	19.9	*j* = 19.9
11	*k*		420	43°14'	*k* = 420×sin43°14'	287.68786	287.7	*k* = 287.7
12		28	*l*	41°54'	*l* = 28/cos41°54'	37.618656	37.6	*l* = 37.6
13		80	*m*	34°38'	*m* = 80/cos34°38'	97.22828	97.2	*m* = 97.2
14	*n*		35	65°45'	*n* = 35×sin65°45'	31.911672	31.9	*n* = 31.9
15	500		*p*	75°18'	*p* = 500/sin75°18'	516.91995	516.9	*p* = 516.9
16	*q*	625		73°46'	*q* = 625×tan73°46'	2146.602	2146.6	*q* = 2146.6
17	2000		*r*	80°30'	*r* = 2000/sin80°30'	2027.8102	2027.8	*r* = 2027.8
18	*s*	40		73°47'	*s* = 40×tan73°47'	137.53156	137.5	*s* = 137.5
19		240	*t*	47°53'	*t* = 240/cos47°53'	357.86582	357.9	*t* = 357.9
20	400		*u*	69°18'	*u* = 400/sin69°18'	427.60442	427.6	*u* = 427.6

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Solutions sheet No. 111						**Mixed Trig Ratio and Pythagoras' Rule**					
		Working using $\sin A = \frac{O}{H}$ or $\cos A = \frac{A}{H}$ or $\tan A = \frac{O}{A}$ or $a^2 = b^2 + c^2$									
No.	**Opp**	**Adj**	**Hyp**	**Angle**	**Equation**	**Working**	**Working**	**Calculator**	**1 dp**	**Solution**
1	12	16	a		$a^2 = 12^2 + 16^2$	$a^2 = 144 + 256$	$a = \sqrt{400}$	20	20	$a = 20$
2	20	b	25		$25^2 = b^2 + 20^2$	$b^2 = 625 - 400$	$b = \sqrt{225}$	15	15	$b = 15$
3	20	c		48°	$\tan 48° = \frac{c}{20}$	$c = 20 \times \tan 48°$		22.2122502	22.2	$c = 22.2$
4	d		50	41°	$\sin 41° = \frac{d}{50}$	$f = 50 \times \sin 71°$		47.2759287	47.3	$d = 47.3$
5	10	10	e		$e^2 = 10^2 + 10^2$	$e^2 = 100 + 100$	$e = \sqrt{200}$	14.1421356	14.1	$e = 14.1$
6	f	15	24		$24^2 = f^2 + 15^2$	$f^2 = 576 - 225$	$f = \sqrt{351}$	18.7349939	18.7	$f = 18.7$
7		g	35	48°	$\cos 48° = \frac{g}{35}$	$g = 35 \times \cos 48°$		23.4195712	23.4	$g = 23.4$
8	h	100		43°	$\tan 43° = \frac{h}{100}$	$h = 100 \times \tan 43°$		93.251508	93.3	$h = 93.3$
9	i	7	25		$25^2 = i^2 + 7^2$	$i^2 = 625 - 49$	$i = \sqrt{576}$	24	24	$i = 24$
10	25		j	38°	$\sin 38° = \frac{j}{25}$	$j = 25 \times \sin 38°$		15.391536	15.4	$j = 15.4$
11		k	125	68°	$\cos 68° = \frac{k}{125}$	$k = 125 \times \cos 68°$		46.825824	46.8	$k = 46.8$
12	35	40	l		$l^2 = 35^2 + 40^2$	$l^2 = 1225 + 1600$	$l = \sqrt{3825}$	61.8465843	61.8	$l = 61.8$
13	m	75	120		$120^2 = m^2 + 75^2$	$m^2 = 14400 - 5625$	$b = \sqrt{8775}$	93.6749699	93.7	$m = 93.7$
14	n	8.7	12.8		$12.8^2 = n^2 + 8.7^2$	$n^2 = 163.84 - 75.69$	$n = \sqrt{88.15}$	9.3888231	9.4	$n = 9.4$
15	p	11.7		46°	$\tan 46° = \frac{p}{11.7}$	$p = 11.7 \times \tan 46°$		12.11570467	12.1	$p = 12.1$
16	q		31.2	42°	$\text{Sin}42° = \frac{q}{31.2}$	$q = 31.2 \times \sin 42°$		20.8768749	20.9	$q = 20.9$
17	r		5.1	39°	$\text{Sin}39° = \frac{r}{11.7}$	$r = 5.1 \times \sin 39°$		3.20953399	3.2	$r = 3.2$
18	s	6.8	9.4		$9.4^2 = s^2 + 6.8^2$	$s^2 = 88.36 - 46.24$	$s = \sqrt{42.12}$	6.4899922	6.5	$s = 6.5$
19		t	2.3	71°	$\cos 71° = \frac{t}{2.3}$	$t = 2.3 \times \cos 71°$		0.74880675	0.7	$t = 0.7$
20	u		37.5	47°	$\text{Sin}47° = \frac{u}{37.5}$	$u = 37.5 \times \sin 47°$		27.42576381	27.4	$u = 27.4$

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Solutions sheet No. 112				**Sine Rule - Find an Side 1**				
Working using $a\sin A = b\sin B$								
No.	**a**	**b**	**A**	**B**	**Equation**	**Calculator**	**Rounded**	**Solution**
1	*a*	10	41°	76°	$a = 10\sin 41°/\sin 76°$	6.7614338	6.8	$a = 6.8$
2	*b*	20	47°	71°	$b = 20\sin 47°/\sin 71°$	15.469896	15.5	$b = 15.5$
3	*c*	35	45°	73°	$c = 35\sin 45°/\sin 73°$	25.879551	25.9	$c = 25.9$
4	*d*	10	32°	80°	$d = 10\sin 32°/\sin 80°$	5.3809412	5.4	$d = 5.4$
5	*e*	13	67°	37°	$e = 13\sin 67°/\sin 37°$	19.884122	19.9	$e = 19.9$
6	*f*	8.75	47°	58°	$f = 8.75\sin 47°/\sin 58°$	7.5459693	7.5	$f = 7.5$
7	*g*	100	72°	31°	$g = 100\sin 72°/\sin 31°$	184.65752	184.7	$g = 184.7$
8	*h*	36	52°	54°	$h = 36\sin 52°/\sin 54°$	35.065255	35.1	$h = 35.1$
9	*i*	6.25	82°	46°	$i = 6.25\sin 82°/\sin 46°$	8.6039663	8.6	$i = 8.6$
10	*j*	300	33°	80°	$j = 300\sin 33°/\sin 80°$	165.91229	165.9	$j = 165.9$
11	*k*	45	70°	75°	$k = 45\sin 70°/\sin 75°$	43.777862	43.8	$k = 43.8$
12	*l*	25	34°	71°	$l = 25\sin 34°/\sin 71°$	14.785349	14.8	$l = 14.8$
13	*m*	60	80°	50°	$m = 60\sin 80°/\sin 50°$	77.134513	77.1	$m = 77.1$
14	*n*	120	41°	73°	$n = 120\sin 41°/\sin 73°$	82.324262	82.3	$n = 82.3$
15	*p*	12.5	44°	64°	$p = 12.5\sin 44°/\sin 64°$	9.6609781	9.7	$p = 9.7$
16	*q*	9.25	83°	36°	$q = 9.25\sin 83°/\sin 36°$	15.619738	15.6	$q = 15.6$
17	*r*	75	48°	72°	$r = 75\sin 48°/\sin 72°$	58.604153	58.6	$r = 58.6$
18	*s*	80	65°	77°	$s = 80\sin 65°/\sin 77°$	74.411792	74.4	$s = 74.4$
19	*t*	2.4	46°	68°	$t = 2.4\sin 46°/\sin 68°$	1.8619991	1.9	$t = 1.9$
20	*u*	32	62°	67°	$u = 32\sin 62°/\sin 67°$	30.694377	30.7	$u = 30.7$

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Solutions sheet No. 113				**Sine Rule - Find an Side 1 (degrees & minutes)**				
Working using $a\sin A = b\sin B$								
No.	**a**	**b**	**A**	**B**	**Equation**	**Calculator**	**Rounded**	**Solution**
1	*a*	20	39°53'	82°41'	*a* = 20sin39°53'/sin82°41'	12.929811	12.9	*a* = 12.9
2	*b*	15	46°21'	68°48'	*b* = 15sin46°21'/sin68°48'	11.641392	11.6	*b* = 11.6
3	*c*	55	44°18'	75°17'	*c* = 55sin44°18'/sin75°17'	39.71576	39.7	*c* = 39.7
4	*d*	44	75°31'	71°16'	*d* = 44sin75°31'/sin71°16'	44.984834	45.0	*d* = 45.0
5	*e*	24	67°38'	31°43'	*e* = 24sin67°38'/sin31°43'	42.217262	42.2	*e* = 42.2
6	*f*	8	43°53'	53°54'	*f* = 8sin43°53'/sin53°54'	6.863375	6.9	*f* = 6.9
7	*g*	140	72°56'	31°7'	*g* = 140sin72°56'/sin31°7'	258.97738	259.0	*g* = 259.0
8	*h*	65	51°57'	58°46'	*h* = 65sin51°57'/sin58°46'	59.86199	59.9	*h* = 59.9
9	*i*	15	28°44'	82°8'	*i* = 15sin28°44'/sin82°8'	7.2795114	7.3	*i* = 7.3
10	*j*	125	41°37'	76°39'	*j* = 125sin41°37'/sin76°39'	85.3236	85.3	*j* = 85.3
11	*k*	25	48°11'	76°27'	*k* = 25sin48°11'/sin76°27'	19.165508	19.2	*k* = 19.2
12	*l*	60	29°26'	77°12'	*l* = 60sin29°26'/sin77°12'	30.236016	30.2	*l* = 30.2
13	*m*	63	77°23'	57°14'	*m* = 63sin77°23'/sin57°14'	73.112261	73.1	*m* = 73.1
14	*n*	115	39°12'	81°49'	*n* = 115sin39°12'/sin81°49'	73.431069	73.4	*n* = 73.4
15	*p*	35	32°12'	82°34'	*p* = 35sin32°12'/sin82°34'	18.808737	18.8	*p* = 18.8
16	*q*	9.6	86°32'	35°25'	*q* = 9.6sin86°32'/sin35°25'	16.535171	16.5	*q* = 16.5
17	*r*	75	35°46'	76°40'	*r* = 75sin35°46'/sin76°40'	45.050778	45.1	*r* = 45.1
18	*s*	13.5	63°18'	71°56'	*s* = 13.5sin63°18'/sin71°56'	12.685979	12.7	*s* = 12.7
19	*t*	50	75°43'	62°41'	*t* = 50sin75°43'/sin62°41'	54.536029	54.5	*t* = 54.5
20	*u*	6.2	81°24'	42°57'	*u* = 6.2sin81°24'/sin42°57'	8.9971391	9.0	*u* = 9.0

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Solutions sheet No. 114					**Sine Rule - Find an Angle 1**			
Working using $a\sin A = b\sin B$								
No.	**a**	**b**	**A**	**Angle**	**Equation**	**Calculator**	**Degrees**	**Solution**
1	9	12	42	*a*	sin*a*° = 9sin42°/12	30.122335	30°	*a*° = 30°
2	20	22	74	*b*	sin*b*° = 20sin74°/22	60.912024	60°	*b*° = 60°
3	25	30	48	*c*	sin*c*° = 25sin48°/30	38.264112	38°	*c*° = 38°
4	9	16	28	*d*	sin*d*° = 9sin28°/16	15.31216	15°	*d*° = 15°
5	40	60	34	*e*	sin*e*° = 40sin34°/60	21.888112	21°	*e*° = 21°
6	17	16	58	*f*	sin*f*° = 17sin58°/16	64.296576	64°	*f*° = 64°
7	70	100	29	*g*	sin*g*° = 70sin29°/100	19.838297	19°	*g*° = 19°
8	38	35	55	*h*	sin*h*° = 38sin55°/35	62.793571	62°	*h*° = 62°
9	26	34	42	*i*	sin*i*° = 26sin42°/34	30.77634	30°	*i*° = 30°
10	160	240	31	*j*	sin*j*° = 160sin31°/240	20.081638	20°	*j*° = 20°
11	18.9	19.4	78	*k*	sin*k*° = 18.9sin78°/19.4	72.352112	72°	*k*° = 72°
12	40	43	73	*l*	sin*l*° = 40sin73°/43	62.821247	62°	*l*° = 62°
13	5.8	7.3	58	*m*	sin*m*° = 5.8sin58°/7.3	42.360384	42°	*m*° = 42°
14	120	132	75	*n*	sin*n*° = 120sin75°/132	61.415733	61°	*n*° = 61°
15	12.8	15.2	66	*p*	sin*p*° = 12.8sin66°/15.2	50.2912	50°	*p*° = 50°
16	9.2	12.2	36	*q*	sin*q*° = 9.2sin36°/12.2	26.311294	26°	*q*° = 26°
17	75	78	74	*r*	sin*r*° = 75sin74°/78	67.561549	67°	*r*° = 67°
18	250	275	78	*s*	sin*s*° = 250sin78°/275	62.776033	62°	*s*° = 62°
19	11.4	13	72	*t*	sin*t*° = 11.4sin72°/13	56.512208	56°	*t*° = 56°
20	3.8	3.6	68	*u*	sin*u*° = 3.8sin68°/3.6	78.151537	78°	*u*° = 78°

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Solutions sheet No. 115					**Sine Rule - Find an Angle 1 (degrees & minutes)**			
Working using $a\sin A = b\sin B$								
No.	**a**	**b**	**B**	**Angle**	**Equation**	**Calculator**	**Degrees**	**Solution**
1	5	6	75°15'	*a*	sin*a*° = 5(sin75°15')/6	53.604286	53°36'	*a*° = *53°36'*
2	18	12	32°41'	*b*	sin*b*° = 18(sin32°41')/12	52.643819	52°39'	*b*° = *52°39'*
3	15	12	46°18'	*c*	sin*c*° = 15(sin46°18')/12	64.049803	64°3'	*c*° = *64°3'*
4	26	50	75°36'	*d*	sin*d*° = 26(sin75°36')/50	30.151053	30°9'	*d*° = *30°9'*
5	31	32	54°40'	*e*	sin*e*° = 31(sin54°40')/32	51.603852	51°36'	*e*° = *51°36'*
6	64	72	58°8'	*f*	sin*f*° = 64(sin58°8')/72	48.922417	48°55'	*f*° = *48°55'*
7	38	48	59°36'	*g*	sin*g*° = 38(sin59°36')/48	42.73362	42°44'	*g*° = *42°44'*
8	95	65	28°28'	*h*	sin*h*° = 95(sin28°28')/65	43.326174	43°20'	*h*° = *43°20'*
9	225	270	76°8'	*i*	sin*i*° = 225(sin76°8')/270	53.957402	53°57'	*i*° = *53°57'*
10	45	52	66°30'	*j*	sin*j*° = 45(sin66°30')/52	52.238641	52°14'	*j*° = *52°14'*
11	14.5	18.9	77°6'	*k*	sin*k*° = 14.5(sin77°6')/18.9	48.377093	48°23'	*k*° = *48°23'*
12	60	80	73°28'	*l*	sin*l*° = 60(sin73°28')/80	45.826137	45°50'	*l*° = *45°50'*
13	19.3	15.6	41°17'	*m*	sin*m*° = 19.3(sin41°17')/15.6	54.258708	54°16'	*m*° = *54°16'*
14	32.5	34.5	76°43'	*n*	sin*n*° = 32.5(sin76°43')/34.5	66.070706	66°4'	*n*° = *66°4'*
15	4.8	6.4	70°52'	*p*	sin*p*° = 4.8(sin70°52')/6.4	44.810923	44°49'	*p*° = *44°49'*
16	17.5	12.5	38°24'	*q*	sin*q*° = 17.5(sin38°24')/12.5	59.533534	59°32'	*q*° = *59°32'*
17	36	20	26°49'	*r*	sin*r*° = 36(sin26°49')/20	52.098506	52°6'	*r*° = *52°6'*
18	12.3	10.7	43°46'	*s*	sin*s*° = 12.3(sin43°46')/10.7	51.626386	51°38'	*s*° = *51°38'*
19	125	180	81°21'	*t*	sin*t*° = 125(sin81°21')/180	43.306009	43°18'	*t*° = *43°18'*
20	4.1	3.3	37°50'	*u*	sin*u*° = 4.1(sin37°50')/3.3	48.392362	48°24'	*u*° = *48°24'*

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Solutions sheet No. 116					**Sine Rule - Find an Angle 2 (degrees & minutes)**			
Working using $a\sin A = b\sin B$								
No.	**a**	**b**	**B**	**Angle**	**Equation**	**Calculator**	**Degrees**	**Solution**
1	30	40	74°22'	*a*	sin*a*° = 30(sin74°22')/40	46.132662	46°8'	*a*° = *46°8'*
2	12	80	25°42'	*b*	sin*b*° = 12(sin25°42')/80	3.6345735	3°38'	*b*° = *3°38'*
3	20	17	47°55'	*c*	sin*c*° = 20(sin47°55')/17	59.363337	59°22'	*c*° = *59°22'*
4	48	56	70°26'	*d*	sin*d*° = 48(sin70°26')/56	53.653816	53°39'	*d*° = *53°39'*
5	180	125	28°44'	*e*	sin*e*° = 180(sin28°44')/125	42.534891	42°32'	*e*° = *42°32'*
6	32	25	38°47'	*f*	sin*f*° = 32(sin38°47')/25	52.003344	52°0'	*f*° = *52°0'*
7	6.2	8.9	82°17'	*g*	sin*g*° = 6.2(sin82°17')/8.9	43.61821	43°37'	*g*° = *43°37'*
8	23	29	74°52'	*h*	sin*h*° = 23(sin74°52')/29	49.674462	49°40'	*h*° = *49°40'*
9	42	50	71°41'	*i*	sin*i*° = 42(sin71°41')/50	52.583116	52°35'	*i*° = *52°35'*
10	55	40	33°58'	*j*	sin*j*° = 55(sin33°58')/40	48.493338	48°30'	*j*° = *48°30'*
11	200	110	24°51'	*k*	sin*k*° = 200(sin24°51')/110	47.690642	47°41'	*k*° = *47°41'*
12	12	9	44°18'	*l*	sin*l*° = 12(sin44°18')/9	67.851702	67°51'	*l*° = *67°51'*
13	75	70	58°51'	*m*	sin*m*° = 75(sin58°51')/70	65.315743	65°19'	*m*° = *65°19'*
14	17	16	57°19'	*n*	sin*n*° = 17(sin57°19')/16	63.010219	63°1'	*n*° = *63°1'*
15	10.3	12.7	76°24'	*p*	sin*p*° = 10.3(sin76°24')/12.7	51.899789	51°54'	*p*° = *51°54'*
16	25.6	19.7	38°24'	*q*	sin*q*° = 25.6(sin38°24')/19.7	53.134629	53°8'	*q*° = *53°8'*
17	22	24	76°47'	*r*	sin*r*° = 22(sin76°47')/24	62.80268	62°48'	*r*° = *62°48'*
18	9	14	82°31'	*s*	sin*s*° = 9(sin82°31')/14	39.538822	39°32'	*s*° = *39°32'*
19	33	35	53°26'	*t*	sin*t*° = 33(sin53°26')/35	48.85085	48°51'	*t*° = *48°51'*
20	32	38	69°18'	*u*	sin*u*° = 32(sin69°18')/38	51.829296	51°50'	*u*° = *51°50'*

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Solutions sheet No. 117					**Cosine Rule - Find an Side 1**			
Working using $a^2 = b^2 + c^2 - 2bc\cos A°$								
No.	**a**	**b**	**c**	**A**	**Equation**	**Calculator**	**Square root**	**Solution**
1	a	15	16	44°	$a^2 = 15^2 + 16^2 - 2\times15\times16\times\cos44°$	$a^2 = 135.717\ldots$	$a = 11.65\ldots$	$a = 11.6$
2	b	20	25	76°	$b^2 = 20^2 + 25^2 - 2\times20\times25\times\cos76°$	$b^2 = 783.078\ldots$	$b = 27.984\ldots$	$b = 28.0$
3	c	35	40	48°	$c^2 = 35^2 + 40^2 - 2\times35\times40\times\cos48°$	$c^2 = 951.434\ldots$	$c = 30.845\ldots$	$c = 30.8$
4	d	15	30	96°	$d^2 = 15^2 + 30^2 - 2\times15\times30\times\cos96°$	$d^2 = 1219.076\ldots$	$d = 34.915\ldots$	$d = 34.9$
5	e	75	80	42°	$e^2 = 75^2 + 80^2 - 2\times75\times80\times\cos42°$	$e^2 = 3107.262\ldots$	$e = 55.743\ldots$	$e = 55.7$
6	f	10	12	38°	$f^2 = 10^2 + 12^2 - 2\times10\times12\times\cos38°$	$f^2 = 54.877\ldots$	$f = 7.408\ldots$	$f = 7.4$
7	g	18	24	68°	$g^2 = 18^2 + 24^2 - 2\times18\times24\times\cos68°$	$g^2 = 576.34\ldots$	$g = 24.007\ldots$	$g = 24.0$
8	h	32	50	61°	$h^2 = 32^2 + 50^2 - 2\times32\times50\times\cos61°$	$h^2 = 1972.609\ldots$	$h = 44.414\ldots$	$h = 44.4$
9	i	65	80	49°	$i^2 = 65^2 + 80^2 - 2\times65\times80\times\cos49°$	$i^2 = 3801.986\ldots$	$i = 61.66\ldots$	$i = 61.7$
10	j	80	100	81°	$j^2 = 80^2 + 100^2 - 2\times80\times100\times\cos81°$	$j^2 = 13897.049\ldots$	$j = 117.886\ldots$	$j = 117.9$
11	k	15.2	16.7	31°	$k^2 = 15.2^2 + 16.7^2 - 2\times15.2\times16.7\times\cos31°$	$k^2 = 74.763\ldots$	$k = 8.647\ldots$	$k = 8.6$
12	l	22	32	48°	$l^2 = 22^2 + 32^2 - 2\times22\times32\times\cos48°$	$l^2 = 565.864\ldots$	$l = 23.788\ldots$	$l = 23.8$
13	m	25	30	102°	$m^2 = 25^2 + 30^2 - 2\times25\times30\times\cos102°$	$m^2 = 1836.868\ldots$	$m = 42.859\ldots$	$m = 42.9$
14	n	30	35	77°	$n^2 = 30^2 + 35^2 - 2\times30\times35\times\cos77°$	$n^2 = 1652.603\ldots$	$n = 40.652\ldots$	$n = 40.7$
15	p	7.2	7.6	37°	$p^2 = 7.2^2 + 7.6^2 - 2\times7.2\times7.6\times\cos37°$	$p^2 = 22.197\ldots$	$p = 4.711\ldots$	$p = 4.7$
16	q	50	75	70°	$q^2 = 50^2 + 75^2 - 2\times50\times75\times\cos70°$	$q^2 = 5559.849\ldots$	$q = 74.564\ldots$	$q = 74.6$
17	r	8.7	10.3	42°	$r^2 = 8.7^2 + 10.3^2 - 2\times8.7\times10.3\times\cos42°$	$r^2 = 48.594\ldots$	$r = 6.971\ldots$	$r = 7.0$
18	s	210	220	29°	$s^2 = 210^2 + 220^2 - 2\times210\times220\times\cos29°$	$s^2 = 11685.139\ldots$	$s = 108.098\ldots$	$s = 108.1$
19	t	6.3	6.9	37°	$t^2 = 6.3^2 + 6.9^2 - 2\times6.3\times6.9\times\cos37°$	$t^2 = 17.867\ldots$	$t = 4.227\ldots$	$t = 4.2$
20	u	10	11	88°	$u^2 = 10^2 + 11^2 - 2\times10\times11\times\cos88°$	$u^2 = 213.322\ldots$	$u = 14.606\ldots$	$u = 14.6$

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Solutions sheet No. 118					**Cosine Rule - Find an Side 1 (degrees & minutes)**			
Working using $a^2 = b^2 + c^2 - 2bc\cos A°$								
No.	**a**	**b**	**c**	**A**	**Equation**	**Calculator**	**Square root**	**Solution**
1	a	18	32	103°22'	$a^2 = 18^2 + 32^2 - 2\times18\times32\times\cos103°22'$	$a^2 = 1614.322\ldots$	$a = 40.179\ldots$	$a = 40.2$
2	b	20	27	69°16'	$b^2 = 20^2 + 27^2 - 2\times20\times27\times\cos69°16'$	$b^2 = 746.659\ldots$	$b = 27.325\ldots$	$b = 27.3$
3	c	29	30	49°30'	$c^2 = 29^2 + 30^2 - 2\times29\times30\times\cos49°30'$	$c^2 = 610.96\ldots$	$c = 24.718\ldots$	$c = 24.7$
4	d	16	18	36°23'	$d^2 = 16^2 + 18^2 - 2\times16\times18\times\cos36°23'$	$d^2 = 116.282\ldots$	$d = 10.783\ldots$	$d = 10.8$
5	e	11	12	87°38'	$e^2 = 11^2 + 12^2 - 2\times11\times12\times\cos87°38'$	$e^2 = 254.098\ldots$	$e = 15.94\ldots$	$e = 15.9$
6	f	15	16	32°47'	$f^2 = 15^2 + 16^2 - 2\times15\times16\times\cos32°47'$	$f^2 = 77.452\ldots$	$f = 8.801\ldots$	$f = 8.8$
7	g	125	135	43°28'	$g^2 = 125^2 + 135^2 - 2\times125\times135\times\cos43°28'$	$g^2 = 9355.103\ldots$	$g = 96.722\ldots$	$g = 96.7$
8	h	36	53	63°41'	$h^2 = 36^2 + 53^2 - 2\times36\times53\times\cos63°41'$	$h^2 = 2413.245\ldots$	$h = 49.125\ldots$	$h = 49.1$
9	i	75	82	33°14'	$i^2 = 75^2 + 82^2 - 2\times75\times82\times\cos33°14'$	$i^2 = 2060.719\ldots$	$i = 45.395\ldots$	$i = 45.4$
10	j	45	71	72°19'	$j^2 = 45^2 + 71^2 - 2\times45\times71\times\cos72°19'$	$j^2 = 5125\ldots$	$j = 71.589\ldots$	$j = 71.6$
11	k	22	27	79°42'	$k^2 = 22^2 + 27^2 - 2\times22\times27\times\cos79°42'$	$k^2 = 1000.583\ldots$	$k = 31.632\ldots$	$k = 31.6$
12	l	2.2	3.2	46°5'	$l^2 = 2.2^2 + 3.2^2 - 2\times2.2\times3.2\times\cos46°5'$	$l^2 = 5.314\ldots$	$l = 2.305\ldots$	$l = 2.3$
13	m	6.6	8.4	48°31'	$m^2 = 6.6^2 + 8.4^2 - 2\times6.6\times8.4\times\cos48°31'$	$m^2 = 40.673\ldots$	$m = 6.378\ldots$	$m = 6.4$
14	n	37	43	83°22'	$n^2 = 37^2 + 43^2 - 2\times37\times43\times\cos83°22'$	$n^2 = 2850.431\ldots$	$n = 53.389\ldots$	$n = 53.4$
15	p	7.5	8	106°53'	$p^2 = 7.5^2 + 8^2 - 2\times7.5\times8\times\cos106°53'$	$p^2 = 155.101\ldots$	$p = 12.454\ldots$	$p = 12.5$
16	q	61	62	35°42'	$q^2 = 61^2 + 62^2 - 2\times61\times62\times\cos35°42'$	$q^2 = 1422.4\ldots$	$q = 37.715\ldots$	$q = 37.7$
17	r	14.8	16.4	79°54'	$r^2 = 14.8^2 + 16.4^2 - 2\times14.8\times16.4\times\cos79°54'$	$r^2 = 402.87\ldots$	$r = 20.072\ldots$	$r = 20.1$
18	s	185	200	28°57'	$s^2 = 185^2 + 200^2 - 2\times185\times200\times\cos28°57'$	$s^2 = 9471.859\ldots$	$s = 97.323\ldots$	$s = 97.3$
19	t	8.6	11.2	40°25'	$t^2 = 8.6^2 + 11.2^2 - 2\times8.6\times11.2\times\cos40°25'$	$t^2 = 52.734\ldots$	$t = 7.262\ldots$	$t = 7.3$
20	u	4.9	5.1	43°46'	$u^2 = 4.9^2 + 5.1^2 - 2\times4.9\times5.1\times\cos43°46'$	$u^2 = 13.926\ldots$	$u = 3.732\ldots$	$u = 3.7$

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Solutions sheet No. 119					**Cosine Rule - Find an Angle 1**			
Working using $cosA = \frac{b^2+c^2-a^2}{2bc}$								
No.	a	b	c	Angle	**Equation**	Calculator	Degrees	Solution
1	6	7	8	*a*	cos*a*° = (7² + 8² - 6²)/(2×7×8)	46.567463	47°	*a*° = 47°
2	10	12	13	*b*	cos*b*° = (12² + 13² - 10²)/(2×12×13)	46.945611	47°	*b*° = 47°
3	24	20	25	*c*	cos*c*° = (20² + 25² - 24²)/(2×20×25)	63.320457	63°	*c*° = 63°
4	28	15	25	*d*	cos*d*° = (15² + 25² - 28²)/(2×15×25)	84.951441	85°	*d*° = 85°
5	60	85	90	*e*	cos*e*° = (85² + 90² - 60²)/(2×85×90)	39.97366	40°	*e*° = 40°
6	6	10	11	*f*	cos*f*° = (10² + 11² - 6²)/(2×10×11)	32.763758	33°	*f*° = 33°
7	20	18	26	*g*	cos*g*° = (18² + 26² - 20²)/(2×18×26)	50.131658	50°	*g*° = 50°
8	40	30	42	*h*	cos*h*° = (30² + 42² - 40²)/(2×30×42)	65.025035	65°	*h*° = 65°
9	25	20	35	*i*	cos*i*° = (20² + 35² - 25²)/(2×20×35)	44.415309	44°	*i*° = 44°
10	45	30	38	*j*	cos*j*° = (30² + 38² - 45²)/(2×30×38)	81.95723	82°	*j*° = 82°
11	4.5	2.5	3	*k*	cos*k*° = (2.5² + 3² - 4.5²)/(2×2.5×3)	109.47122	109°	*k*° = 109°
12	11.5	13.5	15	*l*	cos*l*° = (13.5² + 15² - 11.5²)/(2×13.5×15)	47.233488	47°	*l*° = 47°
13	30	35	40	*m*	cos*m*° = (35² + 40² - 30²)/(2×35×40)	46.567463	47°	*m*° = 47°
14	5.8	7.5	7.9	*n*	cos*n*° = (7.5² + 7.9² - 5.8²)/(2×7.5×7.9)	44.154143	44°	*n*° = 44°
15	150	100	120	*p*	cos*p*° = (100² + 120² - 150²)/(2×100×120)	85.459333	85°	*p*° = 85°
16	65	110	120	*q*	cos*q*° = (110² + 120² - 65²)/(2×110×120)	32.461745	32°	*q*° = 32°
17	7.2	8.6	9.4	*r*	cos*r*° = (8.6² + 9.4² - 7.2²)/(2×8.6×9.4)	46.895973	47°	*r*° = 47°
18	30	20	25	*s*	cos*s*° = (20² + 25² - 30²)/(2×20×25)	82.819244	83°	*s*° = 83°
19	4.5	4.8	5.2	*t*	cos*t*° = (4.8² + 5.2² - 4.5²)/(2×4.8×5.2)	53.304935	53°	*t*° = 53°
20	7.1	5.3	7.4	*u*	cos*u*° = (5.3² + 7.4² - 7.1²)/(2×5.3×7.4)	65.571051	66°	*u*° = 66°

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Solutions sheet No. 120					**Cosine Rule - Find an Angle 1 (degrees & minutes)**			
Working using $cosA = \frac{b^2+c^2-a^2}{2bc}$								
No.	a	b	c	Angle	**Equation**	Calculator	Degrees	Solution
1	7	11	12	*a*	cos*a*° = (11² + 12² - 7²)/(2×11×12)	35.096801	35°6'	*a*° = *35°6'*
2	20	16	22	*b*	cos*b*° = (16² + 22² - 20²)/(2×16×22)	61.121454	61°7'	*b*° = *61°7'*
3	11	13	15	*c*	cos*c*° = (13² + 15² - 11²)/(2×13×15)	45.572996	45°34'	*c*° = *45°34'*
4	50	75	85	*d*	cos*d*° = (75² + 85² - 50²)/(2×75×85)	35.731292	35°44'	*d*° = *35°44'*
5	35	40	45	*e*	cos*e*° = (40² + 45² - 35²)/(2×40×45)	48.189685	48°11'	*e*° = *48°11'*
6	30	54	56	*f*	cos*f*° = (54² + 56² - 30²)/(2×54×56)	31.586338	31°35'	*f*° = *31°35'*
7	58	80	95	*g*	cos*g*° = (80² + 95² - 58²)/(2×80×95)	37.487433	37°29'	*g*° = *37°29'*
8	47	36	47	*h*	cos*h*° = (36² + 47² - 47²)/(2×36×47)	67.481686	67°29'	*h*° = *67°29'*
9	32	25	38	*i*	cos*i*° = (25² + 38² - 32²)/(2×25×38)	56.632987	56°38'	*i*° = *56°38'*
10	65	50	55	*j*	cos*j*° = (50² + 55² - 65²)/(2×50×55)	76.327982	76°20'	*j*° = *76°20'*
11	12.5	7.5	9.5	*k*	cos*k*° = (7.5² + 9.5² - 12.5²)/(2×7.5×9.5)	93.923303	93°55'	*k*° = *93°55'*
12	12	15	16	*l*	cos*l*° = (15² + 16² - 12²)/(2×15×16)	45.40561	45°24'	*l*° = *45°24'*
13	34	28	38	*m*	cos*m*° = (28² + 38² - 34²)/(2×28×38)	59.750967	59°45'	*m*° = *59°45'*
14	35	36	37	*n*	cos*n*° = (36² + 37² - 35²)/(2×36×37)	57.279557	57°17'	*n*° = *57°17'*
15	280	200	230	*p*	cos*p*° = (200² + 230² - 280²)/(2×200×230)	80.931876	80°56'	*p*° = *80°56'*
16	12.1	8.3	11.4	*q*	cos*q*° = (8.3² + 11.4² - 12.1²)/(2×8.3×11.4)	73.912297	73°55'	*q*° = *73°55'*
17	6.4	7.3	7.8	*r*	cos*r*° = (7.3² + 7.8² - 6.4²)/(2×7.3×7.8)	50.020129	50°1'	*r*° = *50°1'*
18	32	21	26	*s*	cos*s*° = (21² + 26² - 32²)/(2×21×26)	85.114496	85°7'	*s*° = *85°7'*
19	3.7	4.2	5.1	*t*	cos*t*° = (4.2² + 5.1² - 3.7²)/(2×4.2×5.1)	45.625411	45°38'	*t*° = *45°38'*
20	60	25	45	*u*	cos*u*° = (25² + 45² - 60²)/(2×25×45)	114.97497	114°58'	*u*° = *114°58'*

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Solutions sheet No. 121				**Area of a Triangle Rule**			
Working using $A = \frac{1}{2}bcsinA$							
No.	**b**	**c**	**A**	**Equation**	**Calculator**	**Rounded**	**Solution**
1	15	16	43°	A = ½×15×16×sin43°	129.95022	130	A = 130 units²
2	20	25	78°	A = ½×20×25×sin78°	817.08831	817.1	A = 817.1 units²
3	18	24	69°	A = ½×18×24×sin69°	590.37009	590.4	A = 590.4 units²
4	15	30	98°	A = ½×15×30×sin98°	1250.2558	1250.3	A = 1250.3 units²
5	75	80	43°	A = ½×75×80×sin43°	3248.7556	3248.8	A = 3248.8 units²
6	10	12	38°	A = ½×10×12×sin38°	54.877419	54.9	A = 54.9 units²
7	7.2	7.6	37°	A = ½×7.2×7.6×sin37°	22.19733	22.2	A = 22.2 units²
8	32	50	61°	A = ½×32×50×sin61°	1972.6092	1972.6	A = 1972.6 units²
9	65	80	49°	A = ½×65×80×sin49°	3801.9861	3802	A = 3802 units²
10	8.7	10.3	42°	A = ½×8.7×10.3×sin42°	48.593584	48.6	A = 48.6 units²
11	15.2	16.7	27°	A = ½×15.2×16.7×sin27°	57.583808	57.6	A = 57.6 units²
12	22	32	47°	A = ½×22×32×sin47°	547.74631	547.7	A = 547.7 units²
13	25	30	102°	A = ½×25×30×sin102°	1836.8675	1836.9	A = 1836.9 units²
14	30	35	77°	A = ½×30×35×sin77°	1652.6028	1652.6	A = 1652.6 units²
15	35	40	47°	A = ½×35×40×sin47°	915.40459	915.4	A = 915.4 units²
16	50	75	71°	A = ½×50×75×sin71°	5683.2388	5683.2	A = 5683.2 units²
17	80	100	82°	A = ½×80×100×sin82°	14173.23	14173	A = 14173.2 units²
18	210	220	29°	A = ½×210×220×sin29°	11685.139	11685	A = 11685.1 units²
19	10	11	89°	A = ½×10×11×sin89°	217.16047	217.2	A = 217.2 units²
20	6.3	6.9	39°	A = ½×6.3×6.9×sin39°	19.73493	19.7	A = 19.7 units²

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Solutions sheet No. 122				Area of a Triangle Rule (degrees & minutes)			
Working using $A = \frac{1}{2}bcsinA$							
No.	**b**	**c**	**A**	**Equation**	**Calculator**	**Rounded**	**Solution**
1	75	82	31°19'	A = ½×75×82×sin31°19'	1841.0156	1841	A = 1841 units²
2	20	27	69°16'	A = ½×20×27×sin69°16'	746.65948	746.7	A = 746.7 units²
3	29	30	49°30'	A = ½×29×30×sin49°30'	610.9604	611	A = 611 units²
4	16	18	37°23'	A = ½×16×18×sin37°23'	122.31543	122.3	A = 122.3 units²
5	11	12	88°8'	A = ½×11×12×sin88°8'	256.40054	256.4	A = 256.4 units²
6	15	16	32°47'	A = ½×15×16×sin32°47'	77.452411	77.5	A = 77.5 units²
7	125	135	43°28'	A = ½×125×135×sin43°28'	9355.1033	9355.1	A = 9355.1 units²
8	36	53	63°41'	A = ½×36×53×sin63°41'	2413.2453	2413.2	A = 2413.2 units²
9	18	32	103°22'	A = ½×18×32×sin103°22'	1614.3216	1614.3	A = 1614.3 units²
10	45	70	74°29'	A = ½×45×70×sin74°29'	5239.6324	5239.6	A = 5239.6 units²
11	22	27	77°36'	A = ½×22×27×sin77°36'	957.89443	957.9	A = 957.9 units²
12	2.2	3.2	47°25'	A = ½×2.2×3.2×sin47°25'	5.5526016	5.6	A = 5.6 units²
13	6.6	8.4	48°11'	A = ½×6.6×8.4×sin48°11'	40.190838	40.2	A = 40.2 units²
14	37	43	83°22'	A = ½×37×43×sin83°22'	2850.4311	2850.4	A = 2850.4 units²
15	7.5	8	104°50'	A = ½×7.5×8×sin104°50'	150.97098	151	A = 151 units²
16	61	62	36°38'	A = ½×61×62×sin36°38'	1495.1134	1495.1	A = 1495.1 units²
17	14.8	16.4	79°54'	A = ½×14.8×16.4×sin79°54'	402.86998	402.9	A = 402.9 units²
18	185	220	28°57'	A = ½×185×220×sin28°57'	11396.545	11397	A = 11396.5 units²
19	8.6	11.2	44°24'	A = ½×8.6×11.2×sin44°24'	61.763983	61.8	A = 61.8 units²
20	4.9	5.1	42°39'	A = ½×4.9×5.1×sin42°39'	13.259404	13.3	A = 13.3 units²

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Solutions sheet No. 123						**Mixed Trig Rule - Find an Side 1**				
Working using $a\sin A = b\sin B$ or $a^2 = b^2 + c^2 - 2bc\cos A°$										
No.	**a**	**b**	**c**	**A**	**B**	**Equation**	**Calculator**	**a^2**	**a**	**Solution**
1	a	12		42°	81°	$a = 12\sin 42°/\sin 81°$	8.1296568		$a = 8.13…$	$a = 8.1$
2	b	25		46°	74°	$b = 25\sin 46°/\sin 74°$	18.70822		$b = 18.708…$	$b = 18.7$
3	c	43	45	47°		$c^2 = 45^2 + 47^2 - 2\times45\times47\times\cos 47°$	1234.6663	$c^2 = 1234.666…$	$c = 35.138…$	$c = 35.1$
4	d	20		29°	82°	$d = 20\sin 29°/\sin 82°$	9.7914824		$d = 9.791…$	$d = 9.8$
5	e	75	85	43°		$e^2 = 85^2 + 43^2 - 2\times85\times43\times\cos 43°$	3525.2403	$e^2 = 3525.24…$	$e = 59.374…$	$e = 59.4$
6	f	8.7		46°	55°	$f = 8.7\sin 46°/\sin 55°$	7.6399202		$f = 7.64…$	$f = 7.6$
7	g	21	27	72°		$g^2 = 27^2 + 72^2 - 2\times27\times72\times\cos 72°$	819.57473	$g^2 = 819.575…$	$g = 28.628…$	$g = 28.6$
8	h	33	52	68°		$h^2 = 52^2 + 68^2 - 2\times52\times68\times\cos 68°$	2507.3502	$h^2 = 2507.35…$	$h = 50.073…$	$h = 50.1$
9	i	65		84°	44°	$i = 65\sin 84°/\sin 44°$	93.058582		$i = 93.059…$	$i = 93.1$
10	j	75	90	84°		$j^2 = 90^2 + 84^2 - 2\times90\times84\times\cos 84°$	12313.866	$j^2 = 12313.866…$	$j = 110.968…$	$j = 111.0$
11	k	45		69°	77°	$k = 45\sin 69°/\sin 77°$	43.116184		$k = 43.116…$	$k = 43.1$
12	l	55		32°	79°	$l = 55\sin 32°/\sin 79°$	29.691068		$l = 29.691…$	$l = 29.7$
13	m	27	32	98°		$m^2 = 32^2 + 98^2 - 2\times32\times98\times\cos 98°$	1993.4911	$m^2 = 1993.491…$	$m = 44.649…$	$m = 44.6$
14	n	150		40°	76°	$n = 150\sin 40°/\sin 76°$	99.369851		$n = 99.37…$	$n = 99.4$
15	p	15.5		41°	75°	$p = 15.5\sin 41°/\sin 75°$	10.527635		$p = 10.528…$	$p = 10.5$
16	q	13	15	76°		$q^2 = 15^2 + 76^2 - 2\times15\times76\times\cos 76°$	299.65046	$q^2 = 299.65…$	$q = 17.31…$	$q = 17.3$
17	r	8.3	9.8	43°		$r^2 = 9.8^2 + 43^2 - 2\times9.8\times43\times\cos 43°$	45.95338	$r^2 = 45.953…$	$r = 6.779…$	$r = 6.8$
18	s	30		68°	74°	$s = 30\sin 68°/\sin 74°$	28.936465		$s = 28.936…$	$s = 28.9$
19	t	7.3	7.9	38°		$t^2 = 7.9^2 + 38^2 - 2\times7.9\times38\times\cos 38°$	24.81084	$t^2 = 24.811…$	$t = 4.981…$	$t = 5.0$
20	u	38		61°	65°	$u = 38\sin 61°/\sin 65°$	36.671371		$u = 36.671…$	$u = 36.7$

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Solutions sheet No. 124	**Mixed Trig Rule - Find an Side 2**									
Working using $a\sin A = b\sin B$ or $a^2 = b^2 + c^2 - 2bc\cos A°$										
No.	**a**	**b**	**c**	**A**	**B**	**Equation**	**Calculator**	**a^2**	**a**	**Solution**
1	a	25	28	42°		$a^2 = 28^2 + 42^2 - 2\times28\times42\times\cos42°$	368.59724	$a^2 = 368.597\ldots$	$a = 19.199\ldots$	$a = 19.2$
2	b	22		48°	75°	$b = 22\sin48°/\sin75°$	16.925923		$b = 16.926\ldots$	$b = 16.9$
3	c	36	40	47°		$c^2 = 40^2 + 47^2 - 2\times40\times47\times\cos47°$	931.84472	$c^2 = 931.845\ldots$	$c = 30.526\ldots$	$c = 30.5$
4	d	15	28	94°		$d^2 = 28^2 + 94^2 - 2\times28\times94\times\cos94°$	1067.5954	$d^2 = 1067.595\ldots$	$d = 32.674\ldots$	$d = 32.7$
5	e	15		65°	39°	$e = 15\sin65°/\sin39°$	21.60206		$e = 21.602\ldots$	$e = 21.6$
6	f	10	12	38°		$f^2 = 12^2 + 38^2 - 2\times12\times38\times\cos38°$	54.877419	$f^2 = 54.877\ldots$	$f = 7.408\ldots$	$f = 7.4$
7	g	100		72°	31°	$g = 100\sin72°/\sin31°$	184.65752		$g = 184.658\ldots$	$g = 184.7$
8	h	36		52°	54°	$h = 36\sin52°/\sin54°$	35.065255		$h = 35.065\ldots$	$h = 35.1$
9	i	6.25		82°	46°	$i = 6.25\sin82°/\sin46°$	8.6039663		$i = 8.604\ldots$	$i = 8.6$
10	j	90	105	83°		$j^2 = 105^2 + 83^2 - 2\times105\times83\times\cos83°$	16821.669	$j^2 = 16821.669\ldots$	$j = 129.698\ldots$	$j = 129.7$
11	k	42		70°	72°	$k = 42\sin70°/\sin72°$	41.498154		$k = 41.498\ldots$	$k = 41.5$
12	l	28		33°	79°	$l = 28\sin33°/\sin79°$	15.535321		$l = 15.535\ldots$	$l = 15.5$
13	m	25	32	103°		$m^2 = 32^2 + 103^2 - 2\times32\times103\times\cos103°$	2008.9217	$m^2 = 2008.922\ldots$	$m = 44.821\ldots$	$m = 44.8$
14	n	36	37	81°		$n^2 = 37^2 + 81^2 - 2\times37\times81\times\cos81°$	2248.2586	$n^2 = 2248.259\ldots$	$n = 47.416\ldots$	$n = 47.4$
15	p	12.2		43°	74°	$p = 12.2\sin43°/\sin74°$	8.6556866		$p = 8.656\ldots$	$p = 8.7$
16	q	40	63	72°		$q^2 = 63^2 + 72^2 - 2\times63\times72\times\cos72°$	4011.5543	$q^2 = 4011.554\ldots$	$q = 63.337\ldots$	$q = 63.3$
17	r	9.7	11.3	43°		$r^2 = 11.33^2 + 43^2 - 2\times11.33\times43\times\cos43°$	61.705894	$r^2 = 61.706\ldots$	$r = 7.855\ldots$	$r = 7.9$
18	s	88		68°	76°	$s = 88\sin68°/\sin76°$	84.090012		$s = 84.09\ldots$	$s = 84.1$
19	t	8.4		44°	67°	$t = 8.4\sin44°/\sin67°$	6.3390544		$t = 6.339\ldots$	$t = 6.3$
20	u	17	19	87°		$u^2 = 19^2 + 87^2 - 2\times19\times87\times\cos87°$	616.19097	$u^2 = 616.191\ldots$	$u = 24.823\ldots$	$u = 24.8$

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Solutions sheet No. 125						Mixed Trig Rule - Find an Angle 1			
Working using $a\sin A = b\sin B$ or $cosA = \frac{b^2+c^2-a^2}{2bc}$									
No.	**a**	**b**	**c**	**A**	**Angle**	**Equation**	**Calculator**	**Degrees**	**Solution**
1	15	10		38	*a*	sin*a*° = (15sin38°)/10	67.442081	67°	*a*° = 67°
2	34	37	45		*b*	cos*b*° = (37² + 45² - 34²)/(2×37×45)	47.77281	47°	*b*° = 47°
3	17	12	28		*c*	cos*c*° = (12² + 28² - 17²)/(2×12×28)	18.03032	18°	*c*° = 18°
4	50	40	55		*d*	cos*d*° = (40² + 55² - 50²)/(2×40×55)	61.121454	61°	*d*° = 61°
5	33	28		43	*e*	sin*e*° = (33sin43°)/28	53.492961	53°	*e*° = 53°
6	16	18		57	*f*	sin*f*° = (16sin57°)/18	48.200769	48°	*f*° = 48°
7	100	72	109		*g*	cos*g*° = (72² + 109² - 100²)/(2×72×109)	63.248958	63°	*g*° = 63°
8	20	18		57	*h*	sin*h*° = (20sin57°)/18	68.726034	68°	*h*° = 68°
9	27	34	37		*i*	cos*i*° = (34² + 37² - 27²)/(2×34×37)	44.452484	44°	*i*° = 44°
10	160	220	240		*j*	cos*j*° = (220² + 240² - 160²)/(2×220×240)	40.415439	40°	*j*° = 40°
11	15.7	16.4		76	*k*	sin*k*° = (15.7sin76°)/16.4	68.260998	68°	*k*° = 68°
12	8.2	12.2	11.3		*l*	cos*l*° = (12.2² + 11.3² - 8.2²)/(2×12.2×11.3)	40.61797	40°	*l*° = 40°
13	7.2	5.8	6.8		*m*	cos*m*° = (5.8² + 6.8² - 7.2²)/(2×5.8×6.8)	69.177339	69°	*m*° = 69°
14	100	110	120		*n*	cos*n*° = (110² + 120² - 100²)/(2×110×120)	51.317813	51°	*n*° = 51°
15	18.8	17.2		65	*p*	sin*p*° = (18.8sin65°)/17.2	82.144322	82°	*p*° = 82°
16	10.2	13.3		36	*q*	sin*q*° = (10.2sin36°)/13.3	26.793911	26°	*q*° = 26°
17	68	74	74		*r*	cos*r*° = (74² + 74² - 68²)/(2×74×74)	54.704466	54°	*r*° = 54°
18	25	24.5		71	*s*	sin*s*° = (25sin71°)/24.5	74.756002	74°	*s*° = 74°
19	9	11.3	12.2		*t*	cos*t*° = (11.3² + 12.2² - 9²)/(2×11.3×12.2)	44.833269	44°	*t*° = 44°
20	3.9	3.7		61	*u*	sin*u*° = (3.9sin61°)/3.7	67.204924	67°	*u*° = 67°

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Solutions sheet No. 126						**Mixed Trig Rule - Find an Angle 2**			
Working using $a\sin A = b\sin B$ or $\cos A = \frac{b^2+c^2-a^2}{2bc}$									
No.	**a**	**b**	**c**	**A**	**Angle**	**Equation**	**Calculator**	**Degrees**	**Solution**
1	15	10	12		*a*	cos*a*° = (10² + 12² - 15²)/(2×10×12)	85.459333	85°	*a*° = 85°
2	9	13		79	*b*	sin*b*° = (9sin79°)/13	42.81146	42°	*b*° = 42°
3	50	40		42	*c*	sin*c*° = (50sin42°)/40	56.763284	56°	*c*° = 56°
4	17	28		24	*d*	sin*d*° = (17sin24°)/28	14.296939	14°	*d*° = 14°
5	70	75	80		*e*	cos*e*° = (75² + 80² - 70²)/(2×75×80)	53.576426	53°	*e*° = 53°
6	20	24	26		*f*	cos*f*° = (24² + 26² - 20²)/(2×24×26)	46.945611	46°	*f*° = 46°
7	100	72	109		*g*	cos*g*° = (72² + 109² - 100²)/(2×72×109)	63.248958	63°	*g*° = 63°
8	37	34		54	*h*	sin*h*° = (37sin54°)/34	61.690755	61°	*h*° = 61°
9	28	22	36		*i*	cos*i*° = (22² + 36² - 28²)/(2×22×36)	51.039249	51°	*i*° = 51°
10	165	240		28	*j*	sin*j*° = (165sin28°)/240	18.830023	18°	*j*° = 18°
11	13.8	17.9		77	*k*	sin*k*° = (13.8sin77°)/17.9	48.693593	48°	*k*° = 48°
12	11.4	13.3	15.1		*l*	cos*l*° = (13.3² + 15.1² - 11.4²)/(2×13.3×15.1)	46.802972	46°	*l*° = 46°
13	5.6	7.4		57	*m*	sin*m*° = (5.6sin57°)/7.4	39.395485	39°	*m*° = 39°
14	140	190		72	*n*	sin*n*° = (140sin72°)/190	44.489495	44°	*n*° = 44°
15	7	8	9		*p*	cos*p*° = (8² + 9² - 8²)/(2×8×9)	48.189685	48°	*p*° = 48°
16	65	110	120		*q*	cos*q*° = (110² + 120² - 65²)/(2×110×120)	32.461745	32°	*q*° = 32°
17	60	75		73	*r*	sin*r*° = (60sin73°)/75	49.910889	49°	*r*° = 49°
18	30	20	25		*s*	cos*s*° = (20² + 25² - 30²)/(2×20×25)	82.819244	82°	*s*° = 82°
19	9	11.4		72	*t*	sin*t*° = (9sin72°)/11.4	48.662681	48°	*t*° = 48°
20	7.2	5.2	7.1		*u*	cos*u*° = (5.2² + 7.1² - 7.2²)/(2×5.2×7.1)	69.706394	69°	*u*° = 69°

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Solutions sheet No. 127	**Mixed Trig Rule - Find an Side 3 (degrees & minutes)**									
Working using $a\sin A = b\sin B$ or $a^2 = b^2 + c^2 - 2bc\cos A°$										
No.	**a**	**b**	**c**	**A**	**B**	**Equation**	**Calculator**	**a^2**	**a**	**Solution**
1	a	17	20	77°38'		$a^2 = 20^2 + 77^2 - 2\times20\times77\times\cos77°38'$	536.03328	$a^2 = 536.033\ldots$	$a = 23.152\ldots$	$a = 23.2$
2	b	21	35	102°47'		$b^2 = 35^2 + 102^2 - 2\times35\times102\times\cos102°47'$	1971.6302	$b^2 = 1971.63\ldots$	$b = 44.403\ldots$	$b = 44.4$
3	c	53	55	46°33'		$c^2 = 55^2 + 46^2 - 2\times55\times46\times\cos46°33'$	1784.1417	$c^2 = 1784.142\ldots$	$c = 42.239\ldots$	$c = 42.2$
4	d	44		75°31'	71°16'	$d = 44\sin75°31'/\sin71°16'$	44.984834		$d = 44.985\ldots$	$d = 45.0$
5	e	24		67°38'	31°43'	$e = 24\sin67°38'/\sin31°43'$	42.217262		$e = 42.217\ldots$	$e = 42.2$
6	f	8		43°53'	53°54'	$f = 8\sin43°53'/\sin53°54'$	6.863375		$f = 6.863\ldots$	$f = 6.9$
7	g	14	15	46°21'		$g^2 = 15^2 + 46^2 - 2\times15\times46\times\cos46°21'$	129.24348	$g^2 = 129.243\ldots$	$g = 11.369\ldots$	$g = 11.4$
8	h	42	55	66°25'		$h^2 = 55^2 + 66^2 - 2\times55\times66\times\cos66°25'$	2909.8767	$h^2 = 2909.877\ldots$	$h = 53.943\ldots$	$h = 53.9$
9	i	15		28°44'	82°8'	$i = 15\sin28°44'/\sin82°8'$	7.2795114		$i = 7.28\ldots$	$i = 7.3$
10	j	125		41°37'	76°39'	$j = 125\sin41°37'/\sin76°39'$	85.3236		$j = 85.324\ldots$	$j = 85.3$
11	k	25		48°11'	76°27'	$k = 25\sin48°11'/\sin76°27'$	19.165508		$k = 19.166\ldots$	$k = 19.2$
12	l	60		29°26'	77°12'	$l = 60\sin29°26'/\sin77°12'$	30.236016		$l = 30.236\ldots$	$l = 30.2$
13	m	12.6	15.3	47°58'		$m^2 = 15.3^2 + 47^2 - 2\times15.3\times47\times\cos47°58'$	129.89871	$m^2 = 129.899\ldots$	$m = 11.397\ldots$	$m = 11.4$
14	n	63	72	82°52'		$n^2 = 72^2 + 82^2 - 2\times72\times82\times\cos82°52'$	7890.4216	$n^2 = 7890.422\ldots$	$n = 88.828\ldots$	$n = 88.8$
15	p	35		32°12'	82°34'	$p = 35\sin32°12'/\sin82°34'$	18.808737		$p = 18.809\ldots$	$p = 18.8$
16	q	23	24	31°17'		$q^2 = 24^2 + 31^2 - 2\times24\times31\times\cos31°17'$	158.6873	$q^2 = 158.687\ldots$	$q = 12.597\ldots$	$q = 12.6$
17	r	48	60	71°6'		$r^2 = 60^2 + 71^2 - 2\times60\times71\times\cos71°6'$	4028.7274	$r^2 = 4028.727\ldots$	$r = 63.472\ldots$	$r = 63.5$
18	s	165		68°26'	73°46'	$s = 165\sin68°26'/\sin73°46'$	159.82027		$s = 159.82\ldots$	$s = 159.8$
19	t	8.2	10.8	42°54'		$t^2 = 10.8^2 + 42^2 - 2\times10.8\times42\times\cos42°54'$	52.254189	$t^2 = 52.254\ldots$	$t = 7.229\ldots$	$t = 7.2$
20	u	38		83°29'	44°17'	$u = 38\sin83°29'/\sin44°17'$	54.073468		$u = 54.073\ldots$	$u = 54.1$

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Solutions sheet No. 128	**Mixed Trig Rule - Find an Side 4 (degrees & minutes)**									
Working using $a\sin A = b\sin B$ or $a^2 = b^2 + c^2 - 2bc\cos A°$										
No.	**a**	**b**	**c**	**A**	**B**	**Equation**	**Calculator**	**a^2**	**a**	**Solution**
1	a	8		39°53'	84°26'	$a = 8\sin 39°53'/\sin 84°26'$	5.1541184		$a = 5.154…$	$a = 5.2$
2	b	46	55	67°17'		$b^2 = 55^2 + 67^2 - 2×55×67×\cos 67°17'$	3163.9005	$b^2 = 3163.9…$	$b = 56.249…$	$b = 56.2$
3	c	29	60	48°57'		$c^2 = 60^2 + 48^2 - 2×60×48×\cos 48°57'$	2112.4255	$c^2 = 2112.425…$	$c = 45.961…$	$c = 46.0$
4	d	81		76°38'	79°36'	$d = 81\sin 76°38'/\sin 79°36'$	80.122041		$d = 80.122…$	$d = 80.1$
5	e	16	18	88°5'		$e^2 = 18^2 + 88^2 - 2×18×88×\cos 88°5'$	559.89789	$e^2 = 559.898…$	$e = 23.662…$	$e = 23.7$
6	f	40		44°28'	51°32'	$f = 40\sin 44°28'/\sin 51°32'$	35.786506		$f = 35.787…$	$f = 35.8$
7	g	100		74°13'	31°48'	$g = 100\sin 74°13'/\sin 31°48'$	182.6144		$g = 182.614…$	$g = 182.6$
8	h	42	55	65°27'		$h^2 = 55^2 + 65^2 - 2×55×65×\cos 65°27'$	2836.5036	$h^2 = 2836.504…$	$h = 53.259…$	$h = 53.3$
9	i	24	25	35°26'		$i^2 = 25^2 + 35^2 - 2×25×35×\cos 35°26'$	218.01755	$i^2 = 218.018…$	$i = 14.765…$	$i = 14.8$
10	j	115		37°30'	74°34'	$j = 115\sin 37°30'/\sin 74°34'$	72.626419		$j = 72.626…$	$j = 72.6$
11	k	100	125	76°47'		$k^2 = 125^2 + 76^2 - 2×125×76×\cos 76°47'$	19576.953	$k^2 = 19576.953…$	$k = 139.918…$	$k = 139.9$
12	l	15.6		28°33'	82°49'	$l = 15.6\sin 28°33'/\sin 82°49'$	7.514619		$l = 7.515…$	$l = 7.5$
13	m	25	28	45°34'		$m^2 = 28^2 + 45^2 - 2×28×45×\cos 45°34'$	419.05051	$m^2 = 419.051…$	$m = 20.471…$	$m = 20.5$
14	n	115		39°12'	81°49'	$n = 115\sin 39°12'/\sin 81°49'$	73.431069		$n = 73.431…$	$n = 73.4$
15	p	75		33°38'	75°24'	$p = 75\sin 33°38'/\sin 75°24'$	42.926846		$p = 42.927…$	$p = 42.9$
16	q	11.4	11.8	32°41'		$q^2 = 11.8^2 + 32^2 - 2×11.8×32×\cos 32°41'$	41.04114	$q^2 = 41.041…$	$q = 6.406…$	$q = 6.4$
17	r	78		38°14'	80°55'	$r = 78\sin 38°14'/\sin 80°55'$	48.884531		$r = 48.885…$	$r = 48.9$
18	s	400		58°47'	98°42'	$s = 400\sin 58°47'/\sin 98°42'$	346.0673		$s = 346.067…$	$s = 346.1$
19	t	14	14	44°19'		$t^2 = 14^2 + 44^2 - 2×14×44×\cos 44°19'$	110.0188	$t^2 = 110.019…$	$t = 10.489…$	$t = 10.5$
20	u	52	56	46°20'		$u^2 = 56^2 + 46^2 - 2×56×46×\cos 46°20'$	1794.3097	$u^2 = 1794.31…$	$u = 42.359…$	$u = 42.4$

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Solutions sheet No. 129	Mixed Sine and Cosine Rules - Find an Angle 3 (degrees & minutes)

Working using $a\sin A = b\sin B$ or $\cos A = \frac{b^2 + c^2 - a^2}{2bc}$

No.	a	b	c	A	Equation	Calculator	Degrees	Solution
1	6	8		75°18'	sin*a*° = (6sin75°18'°)/8	46.506363	46°30'	*a*° = 46°30'
2	16	10	14		cos*b*° = (10² + 14² - 16²)/(2×10×14)	81.786789	81°47'	*b*° = 81°47'
3	12	14	16		cos*c*° = (14² + 16² - 12²)/(2×14×16)	46.567463	46°34'	*c*° = 46°34'
4	25	40		83°31'	sin*d*° = (25sin83°31'°)/40	38.389413	38°23'	*d*° = 38°23'
5	29	30		52°45'	sin*e*° = (29sin52°45'°)/30	50.306194	50°18'	*e*° = 50°18'
6	67	77		61°15'	sin*f*° = (67sin61°15'°)/77	49.717526	49°43'	*f*° = 49°43'
7	63	85	90		cos*g*° = (85² + 90² - 63²)/(2×85×90)	42.07894	42°5'	*g*° = 42°5'
8	46	37	48		cos*h*° = (37² + 48² - 46²)/(2×37×48)	64.001693	64°0'	*h*° = 64°0'
9	85	105		77°25'	sin*i*° = (85sin77°25'°)/105	52.192913	52°12'	*i*° = 52°12'
10	60	40	50		cos*j*° = (40² + 50² - 60²)/(2×40×50)	82.819244	82°49'	*j*° = 82°49'
11	14	18		77°6'	sin*k*° = (14sin77°6'°)/18	49.301165	49°18'	*k*° = 49°18'
12	12.3	15.1		76°25'	sin*l*° = (12.3sin76°25'°)/15.1	52.352684	52°21'	*l*° = 52°21'
13	32	26	37		cos*m*° = (26² + 37² - 32²)/(2×26×37)	57.949584	57°57'	*m*° = 57°57'
14	35	36	40		cos*n*° = (36² + 40² - 35²)/(2×36×40)	54.534803	54°32'	*n*° = 54°32'
15	51	64		73°32'	sin*p*° = (51sin73°32'°)/64	49.835075	49°50'	*p*° = 49°50'
16	12.6	8.7	11.6		cos*q*° = (8.7² + 11.6² - 12.6²)/(2×8.7×11.6)	75.220308	75°13'	*q*° = 75°13'
17	5.9	7.2	7.5		cos*r*° = (7.2² + 7.5² - 5.9²)/(2×7.2×7.5)	47.272017	47°16'	*r*° = 47°16'
18	19.3	16.7		41°43'	sin*s*° = (19.3sin41°43'°)/16.7	50.268667	50°16'	*s*° = 50°16'
19	96	115		79°22'	sin*t*° = (96sin79°22'°)/115	55.129651	55°8'	*t*° = 55°8'
20	41	21	34		cos*u*° = (21² + 34² - 41²)/(2×21×34)	93.372287	93°22'	*u*° = 93°22'

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Solutions sheet No. 130	Mixed Sine and Cosine Rules - Find an Angle 4 (degrees & minutes)

Working using $a\sin A = b\sin B$ or $\cos A = \frac{b^2 + c^2 - a^2}{2bc}$

No.	a	b	c	A	Equation	Calculator	Degrees	Solution
1	17	22	24		$\cos a° = (22^2 + 24^2 - 17^2)/(2\times22\times24)$	43.104079	43°6'	$a° = 43°6'$
2	18	15		31°34'	$\sin b° = (18\sin31°34'°)/15$	38.916589	38°55'	$b° = 38°55'$
3	26	33	38		$\cos c° = (33^2 + 38^2 - 26^2)/(2\times33\times38)$	42.231889	42°14'	$c° = 42°14'$
4	31	40		82°36'	$\sin d° = (31\sin82°36'°)/40$	50.223424	50°13'	$d° = 50°13'$
5	30	28	45		$\cos e° = (28^2 + 45^2 - 30^2)/(2\times28\times45)$	40.752221	40°45'	$e° = 40°45'$
6	30	54	56		$\cos f° = (54^2 + 56^2 - 30^2)/(2\times54\times56)$	31.586338	31°35'	$f° = 31°35'$
7	38	48		59°36'	$\sin g° = (38\sin59°36'°)/48$	43.064663	43°4'	$g° = 43°4'$
8	95	65		29°3'	$\sin h° = (95\sin29°3'°)/65$	45.209142	45°13'	$h° = 45°13'$
9	37	32	42		$\cos i° = (32^2 + 42^2 - 37^2)/(2\times32\times42)$	58.136204	58°8'	$i° = 58°8'$
10	42	48		61°36'	$\sin j° = (42\sin61°36'°)/48$	50.326284	50°20'	$j° = 50°20'$
11	16.5	11.1	12.4		$\cos k° = (11.1^2 + 12.4^2 - 16.5^2)/(2\times11.1\times12.4)$	89.017548	89°1'	$k° = 89°1'$
12	40	50		75°48'	$\sin l° = (40\sin75°48'°)/50$	50.855494	50°51'	$l° = 50°51'$
13	34	28	38		$\cos m° = (28^2 + 38^2 - 34^2)/(2\times28\times38)$	59.750967	59°45'	$m° = 59°45'$
14	35	36	37		$\cos n° = (36^2 + 37^2 - 35^2)/(2\times36\times37)$	57.279557	57°17'	$n° = 57°17'$
15	4.8	6.4		70°52'	$\sin p° = (4.8\sin70°52'°)/6.4$	45.118587	45°7'	$p° = 45°7'$
16	60	48		42°24'	$\sin q° = (60\sin42°24'°)/48$	57.445287	57°27'	$q° = 57°27'$
17	6.9	8.2	8.3		$\cos r° = (8.2^2 + 8.3^2 - 6.9^2)/(2\times8.2\times8.3)$	49.435131	49°26'	$r° = 49°26'$
18	12.5	10.5		43°54'	$\sin s° = (12.5\sin43°54'°)/10.5$	55.63702	55°38'	$s° = 55°38'$
19	95	125	130		$\cos t° = (125^2 + 130^2 - 95^2)/(2\times125\times130)$	43.690895	43°41'	$t° = 43°41'$
20	9.8	7.6		36°45'	$\sin u° = (9.8\sin36°45'°)/7.6$	50.490925	50°29'	$u° = 50°29'$

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