

| Solutions sheet No. 117 | | | | Cosine Rule - Find an Side 1 | | | | |
|---|---|------|------|------------------------------|--|------------------------|--------------------|-------------|
| Working using $a^2 = b^2 + c^2 - 2bccosA^\circ$ | | | | | | | | |
| No. | a | b | c | A | Equation | Calculator | Square root | Solution |
| 1 | a | 15 | 16 | 44° | $a^2 = 15^2 + 16^2 - 2 \times 15 \times 16 \times \cos 44^\circ$ | $a^2 = 135.717\dots$ | $a = 11.65\dots$ | $a = 11.6$ |
| 2 | b | 20 | 25 | 76° | $b^2 = 20^2 + 25^2 - 2 \times 20 \times 25 \times \cos 76^\circ$ | $b^2 = 783.078\dots$ | $b = 27.984\dots$ | $b = 28.0$ |
| 3 | c | 35 | 40 | 48° | $c^2 = 35^2 + 40^2 - 2 \times 35 \times 40 \times \cos 48^\circ$ | $c^2 = 951.434\dots$ | $c = 30.845\dots$ | $c = 30.8$ |
| 4 | d | 15 | 30 | 96° | $d^2 = 15^2 + 30^2 - 2 \times 15 \times 30 \times \cos 96^\circ$ | $d^2 = 1219.076\dots$ | $d = 34.915\dots$ | $d = 34.9$ |
| 5 | e | 75 | 80 | 42° | $e^2 = 75^2 + 80^2 - 2 \times 75 \times 80 \times \cos 42^\circ$ | $e^2 = 3107.262\dots$ | $e = 55.743\dots$ | $e = 55.7$ |
| 6 | f | 10 | 12 | 38° | $f^2 = 10^2 + 12^2 - 2 \times 10 \times 12 \times \cos 38^\circ$ | $f^2 = 54.877\dots$ | $f = 7.408\dots$ | $f = 7.4$ |
| 7 | g | 18 | 24 | 68° | $g^2 = 18^2 + 24^2 - 2 \times 18 \times 24 \times \cos 68^\circ$ | $g^2 = 576.34\dots$ | $g = 24.007\dots$ | $g = 24.0$ |
| 8 | h | 32 | 50 | 61° | $h^2 = 32^2 + 50^2 - 2 \times 32 \times 50 \times \cos 61^\circ$ | $h^2 = 1972.609\dots$ | $h = 44.414\dots$ | $h = 44.4$ |
| 9 | i | 65 | 80 | 49° | $i^2 = 65^2 + 80^2 - 2 \times 65 \times 80 \times \cos 49^\circ$ | $i^2 = 3801.986\dots$ | $i = 61.66\dots$ | $i = 61.7$ |
| 10 | j | 80 | 100 | 81° | $j^2 = 80^2 + 100^2 - 2 \times 80 \times 100 \times \cos 81^\circ$ | $j^2 = 13897.049\dots$ | $j = 117.886\dots$ | $j = 117.9$ |
| 11 | k | 15.2 | 16.7 | 31° | $k^2 = 15.2^2 + 16.7^2 - 2 \times 15.2 \times 16.7 \times \cos 31^\circ$ | $k^2 = 74.763\dots$ | $k = 8.647\dots$ | $k = 8.6$ |
| 12 | l | 22 | 32 | 48° | $l^2 = 22^2 + 32^2 - 2 \times 22 \times 32 \times \cos 48^\circ$ | $l^2 = 565.864\dots$ | $l = 23.788\dots$ | $l = 23.8$ |
| 13 | m | 25 | 30 | 102° | $m^2 = 25^2 + 30^2 - 2 \times 25 \times 30 \times \cos 102^\circ$ | $m^2 = 1836.868\dots$ | $m = 42.859\dots$ | $m = 42.9$ |
| 14 | n | 30 | 35 | 77° | $n^2 = 30^2 + 35^2 - 2 \times 30 \times 35 \times \cos 77^\circ$ | $n^2 = 1652.603\dots$ | $n = 40.652\dots$ | $n = 40.7$ |
| 15 | p | 7.2 | 7.6 | 37° | $p^2 = 7.2^2 + 7.6^2 - 2 \times 7.2 \times 7.6 \times \cos 37^\circ$ | $p^2 = 22.197\dots$ | $p = 4.711\dots$ | $p = 4.7$ |
| 16 | q | 50 | 75 | 70° | $q^2 = 50^2 + 75^2 - 2 \times 50 \times 75 \times \cos 70^\circ$ | $q^2 = 5559.849\dots$ | $q = 74.564\dots$ | $q = 74.6$ |
| 17 | r | 8.7 | 10.3 | 42° | $r^2 = 8.7^2 + 10.3^2 - 2 \times 8.7 \times 10.3 \times \cos 42^\circ$ | $r^2 = 48.594\dots$ | $r = 6.971\dots$ | $r = 7.0$ |
| 18 | s | 210 | 220 | 29° | $s^2 = 210^2 + 220^2 - 2 \times 210 \times 220 \times \cos 29^\circ$ | $s^2 = 11685.139\dots$ | $s = 108.098\dots$ | $s = 108.1$ |
| 19 | t | 6.3 | 6.9 | 37° | $t^2 = 6.3^2 + 6.9^2 - 2 \times 6.3 \times 6.9 \times \cos 37^\circ$ | $t^2 = 17.867\dots$ | $t = 4.227\dots$ | $t = 4.2$ |
| 20 | u | 10 | 11 | 88° | $u^2 = 10^2 + 11^2 - 2 \times 10 \times 11 \times \cos 88^\circ$ | $u^2 = 213.322\dots$ | $u = 14.606\dots$ | $u = 14.6$ |