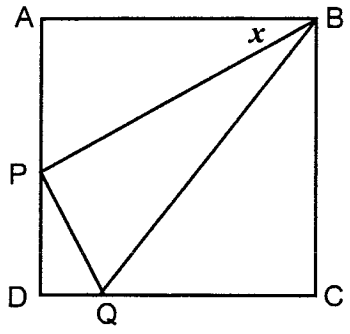
Trigonometry

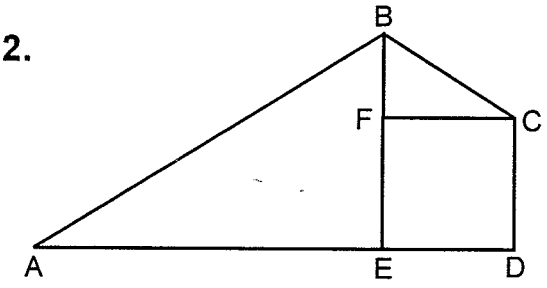
Drawings on this sheet are NOT to scale.

1. In the drawing on the right ABCD is a square.
AP = 5 cm QC = 7 cm PB = 12 cm
Calculate

(a) the size of the angle marked x
(b) the length of AB
(c) the length of DQ
(d) the length of PD
(e) the size of $\angle BQD$



2.

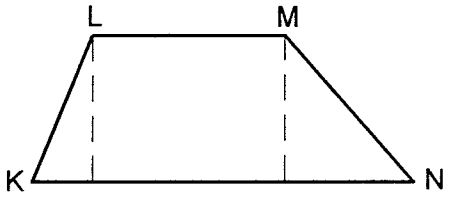


In the drawing on the left CDEF is a square.
EF = 4.7 cm $\angle BCF = 36°$ $\angle BAE = 28°$
Calculate the lengths of

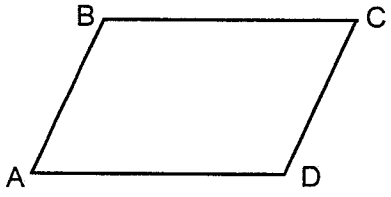
(a) BF
(b) AB
(c) AD

3. KLMN is a trapezium with LM parallel to KN.
LM = 8.4 cm KN = 19.6 cm
KL = 10.7 cm $\angle LKN = 58°$
Calculate

(a) the perpendicular distance between the parallel edges
(b) the area of the trapezium
(c) the perimeter of the trapezium.



4.

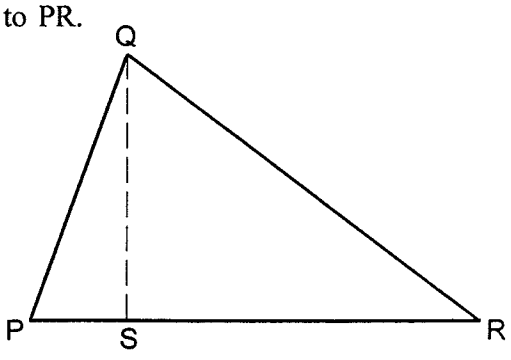


ABCD is a parallelogram
AB = 3.8 cm BC = 7.9 cm $\angle BAD = 48°$
Calculate

(a) the area of the parallelogram
(b) the length of the longer diagonal AC.

5. In the triangle PQR, S is the foot of the perpendicular from Q to PR.
QS = 7.5 cm $\angle QPR = 75°$ $\angle QRP = 40°$
Calculate

(a) the length of SR
(b) the length of PS
(c) the length of QR
(d) the perimeter of triangle PQR
(e) the area of triangle PQR.



Trigonometry (T/27)

1. a) $\sin x = \frac{5}{12}$

$x = \sin^{-1}\frac{5}{12}$

$= 24.6243\ldots$ ✓

$= 24.62°$ ✓ (2dp)

b) $\cos 24.62 = \frac{AB}{12}$ should use Pythagoras +/or the given results

$12 \cos 24.6243\ldots = AB$

$AB = 10.9087\ldots$ ✓

$= 10.91$ cm (2dp)

$AB^2 = 12^2 - 5^2$

$= 144 - 25$

$= 119$

$AB = 10.91$ cm

c) AB = DC

$DQ = DC - QC$

$= 10.91 - 7$

$= 3.91$ cm ✓ (2dp)

d) AB = AD

$AP = AD - AP$

$= 10.91 - 5$ ✓

$= 5.91$ cm ✓ (2dp)

e) $\tan \angle BQC = \frac{10.91}{7}$

$\angle BQC = \tan^{-1}\frac{10.91}{7}$

$= 57.32°$ ✓ (2dp)

$\angle BQD = 180° - 57.32°$

$= 122.68°$ ✓

a) FC = EF = 4.7

$\tan 36° = \frac{BF}{4.7}$ ✓

$4.7 \tan 36° = BF$

$BF = 3.4$ cm ✓ (1dp)

b) $BE = 3.4 + 4.7 = 8.1$ ✓

$\sin 28° = \frac{8.1}{AB}$

$AB \sin 28 = 8.1$

$AB = \frac{8.1}{\sin 28}$ ✓

c) $\cos 28 = \frac{AE}{17.3}$

$AE = 17.3 \cos 28$ ✓

$= 15.3$ cm (1dp)

$AD = 15.3 + 4.7 = 20$ cm ✓

3a) $\sin 58° = \frac{x}{10.7}$

$x = 10.7 \sin 58°$

$= 9.1$ cm ✓ (1dp)

b) $A = \frac{1}{2} h (a+b)$

$= \frac{1}{2} \times 9.1 (8.4 + 19.6)$

$= 127.4$ cm^2 ✓

c) $\cos 58° = \frac{y}{10.7}$

$10.7 \cos 58° = y$

$y = 5.7$ cm ✓ (1dp)

$z = 19.6 - (5.7 + 8.4) = 5.5$

$MN^2 = 5.5^2 + 9.1^2$ ✓

$= 113.06$

$MN = 10.6$ cm (1dp)

Perimeter $= 8.4 + 10.6 + 19.6 + 10.7$ ✓

$= 49.3$ cm

4a) $\sin 48° = \frac{h}{3.8}$ or use $\frac{1}{2} ab \sin C \times 2$

$3.8 \sin 48° = h$

$h = 2.8$ cm (1dp) ✓

$= 7.9 \times 3.8 \times \sin 48°$

$= 22.31$ cm^2

Area $= b \times h$

$= 7.9 \times 2.8 = 22.12$ cm^2 ✓

b) $\angle ADC = 180° - 48° = 132°$

$AC^2 = 7.9^2 + 3.8^2 - 2 \times 3.8 \times 7.9 \times \cos 132$

$= 117.0246\ldots$ ✓

$AC = 10.8177\ldots$

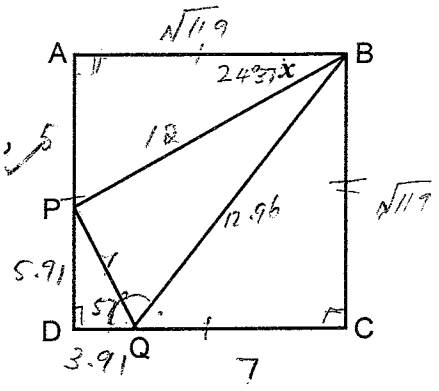
$= 10.8$ cm (1dp) ✓

Trigonometry

Drawings on this sheet are NOT to scale.

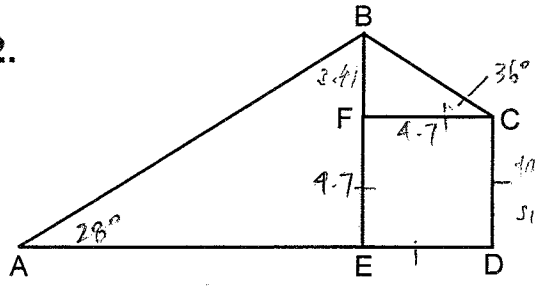
1. In the drawing on the right ABCD is a square.
AP = 5 cm QC = 7 cm PB = 12 cm
Calculate

(a) the size of the angle marked x 24°37'
(b) the length of AB $\sqrt{119}$ cm
(c) the length of DQ 3.91 cm
(d) the length of PD 5.91 cm
(e) the size of ∠BQD 122°41'



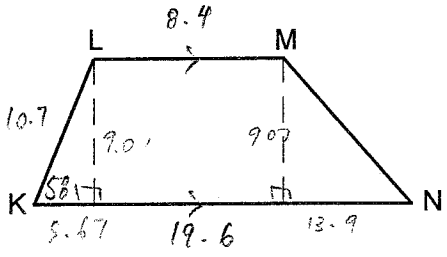
2. In the drawing on the left CDEF is a square.
EF = 4.7 cm ∠BCF = 36° ∠BAE = 28°
Calculate the lengths of

(a) BF 3.41 cm
(b) AB 17.28 cm
(c) AD 19.96 cm



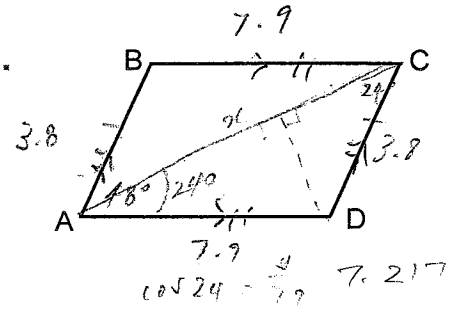
3. KLMN is a trapezium with LM parallel to KN.
LM = 8.4 cm KN = 19.6 cm
KL = 10.7 cm ∠LKN = 58°
Calculate

(a) the perpendicular distance between the parallel edges 9.07 cm
(b) the area of the trapezium 127.04 cm²
(c) the perimeter of the trapezium. 55.32 cm



4. ABCD is a parallelogram
AB = 3.8 cm BC = 7.9 cm ∠BAD = 48°
Calculate

(a) the area of the parallelogram 22.31 cm²
(b) the length of the longer diagonal AC. 10.82 cm



5. In the triangle PQR, S is the foot of the perpendicular from Q to PR.
QS = 7.5 cm ∠QPR = 75° ∠QRP = 40°
Calculate

(a) the length of SR 8.9 cm
(b) the length of PS 2.0 cm
(c) the length of QR 11.6 cm
(d) the perimeter of triangle PQR 30.26 cm
(e) the area of triangle PQR. 40.875 cm²