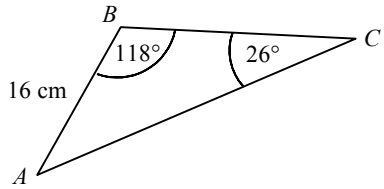
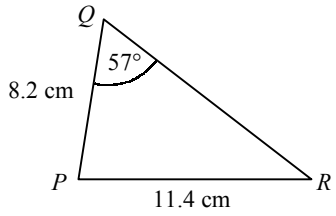
1



The diagram shows triangle ABC in which $AB = 16$ cm, $\angle ABC = 118°$ and $\angle ACB = 26°$.
Use the sine rule to find the length AC to 3 significant figures.

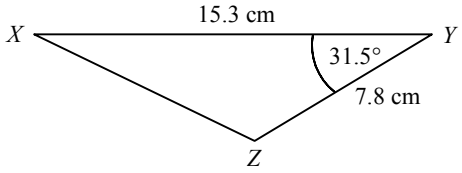
2



The diagram shows triangle PQR in which $PQ = 8.2$ cm, $PR = 11.4$ cm and $\angle PQR = 57°$.
Use the sine rule to find the size of $\angle PRQ$ in degrees to 1 decimal place.

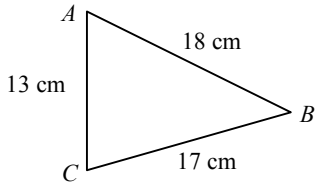
3 In triangle ABC, $AB = 16.2$ cm, $BC = 12.3$ cm and $\angle BAC = 37°$.
Find the two possible sizes of $\angle ACB$ and the corresponding lengths of AC.

4



The diagram shows triangle XYZ in which $XY = 15.3$ cm, $YZ = 7.8$ cm and $\angle XYZ = 31.5°$.
Use the cosine rule to find the length XZ.

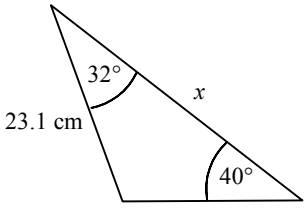
5



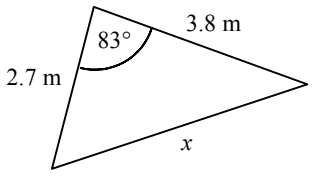
The diagram shows triangle ABC in which $AB = 18$ cm, $AC = 13$ cm and $BC = 17$ cm.
Use the cosine rule to find the size of $\angle ACB$.

6 Find the length x in each triangle.

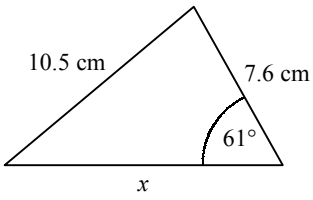
a



b

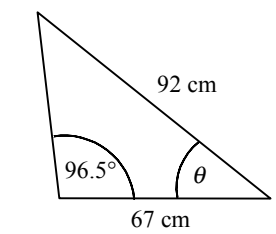


c

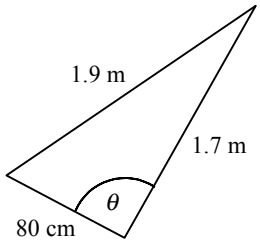


7 Find the angle θ in each triangle.

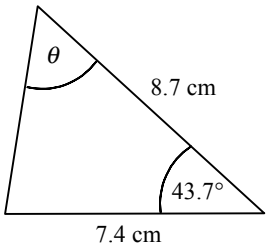
a



b

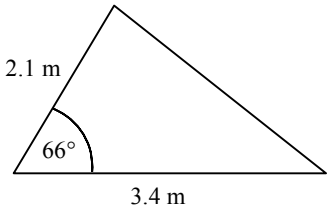


c

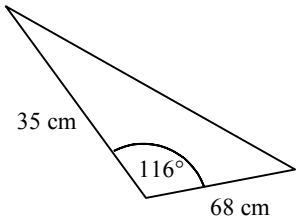


8 Find the area of each of the following triangles.

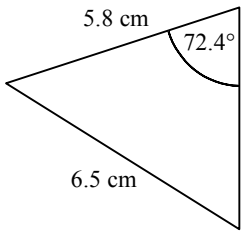
a



b



c



9 Joanne walks 4.2 miles on a bearing of 138°. She then walks 7.8 miles on a bearing of 251°.

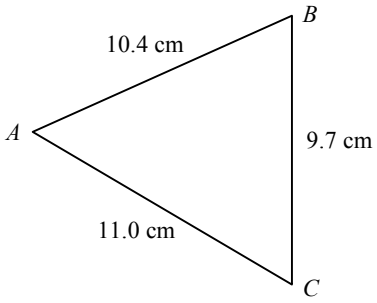
a Calculate how far Joanne is from the point where she started.

b Find, as a bearing, the direction in which Joanne would have to walk in order to return to the point where she started.

10 A ferry and a cargo ship are both approaching the same port. The ferry is 3.2 km from the port on a bearing of 076° and the cargo ship is 6.9 km from the port on a bearing of 323°.

Find the distance between the two vessels and the bearing of the cargo ship from the ferry.

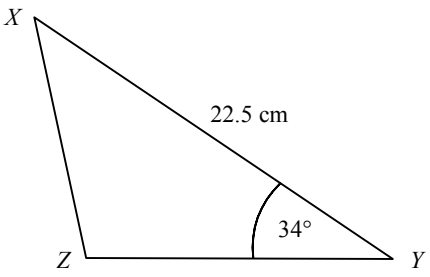
11



The diagram shows triangle ABC in which $AB = 10.4$ cm, $AC = 11.0$ cm and $BC = 9.7$ cm.

Find the area of the triangle to 3 significant figures.

12



The diagram shows triangle XYZ in which $XY = 22.5$ cm and $\angle XYZ = 34°$.

Given that the area of the triangle is 100 cm^2, find the length XZ.

1 Find to 3 decimal places the value of

a $\sin 131°$ **b** $\tan 340.5°$ **c** $\cos 418°$ **d** $\sin (-165.2°)$

2 Give the exact value of

a $\cos 60°$ **b** $\sin 45°$ **c** $\tan 45°$ **d** $\cos 30°$

e $\sin 90°$ **f** $\tan 30°$ **g** $\cos 120°$ **h** $\sin 135°$

i $\tan 210°$ **j** $\cos 225°$ **k** $\sin 300°$ **l** $\tan 120°$

m $\cos 330°$ **n** $\tan 150°$ **o** $\cos (-60°)$ **p** $\sin 405°$

q $\tan (-45°)$ **r** $\sin (-240°)$ **s** $\tan 570°$ **t** $\cos (-150°)$

3 Find to 3 decimal places the value of

a $\cos 0.42^c$ **b** $\sin 4.16^c$ **c** $\tan (-3.1^c)$ **d** $\cos 11.25^c$

4 Give the exact value of

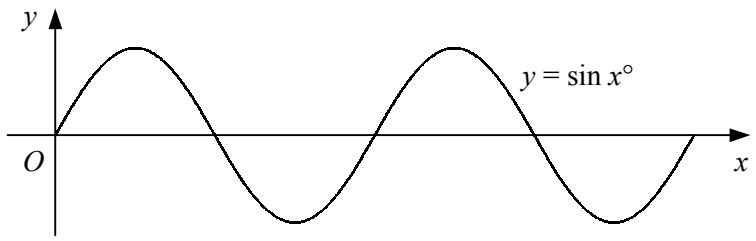
a $\sin \frac{\pi}{6}$ **b** $\cos \frac{\pi}{2}$ **c** $\sin \frac{\pi}{4}$ **d** $\tan \frac{\pi}{3}$

e $\cos \frac{\pi}{3}$ **f** $\sin \frac{2\pi}{3}$ **g** $\tan \frac{3\pi}{4}$ **h** $\cos \frac{5\pi}{6}$

i $\tan \frac{5\pi}{3}$ **j** $\cos \frac{5\pi}{4}$ **k** $\sin (-\frac{\pi}{6})$ **l** $\tan (-\frac{5\pi}{6})$

m $\sin 3\pi$ **n** $\tan (-\frac{5\pi}{4})$ **o** $\cos \frac{8\pi}{3}$ **p** $\sin (-\frac{7\pi}{3})$

5

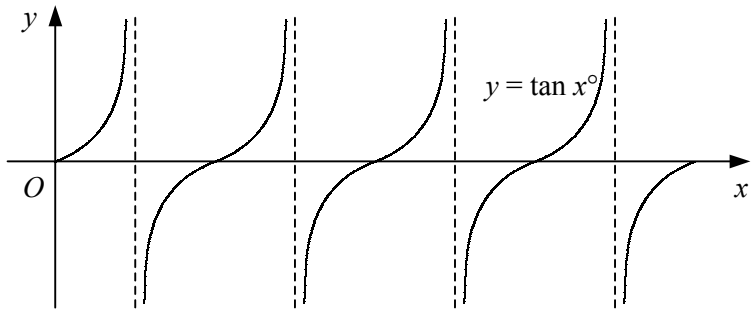


The graph shows the curve $y = \sin x°$ in the interval $0 \le x \le 720$.

a Write down the coordinates of any points where the curve intersects the coordinate axes.

b Write down the coordinates of the turning points of the curve.

6



The graph shows the curve $y = \tan x°$ in the interval $0 \le x \le 720$.

a Write down the coordinates of any points where the curve intersects the coordinate axes.

b Write down the equations of the asymptotes.

7 Describe the transformation that maps the graph of $y = \sin x°$ onto the graph of

a $y = 3 \sin x°$ **b** $y = \sin 4x°$ **c** $y = \sin (x + 60)°$ **d** $y = \sin (-x°)$

8 Sketch each of the following pairs of curves on the same set of axes in the interval $0 \leq x \leq 360°$.

a $y = \cos x$ and $y = 3 \cos x$ **b** $y = \sin x$ and $y = \sin (x - 30°)$

c $y = \cos x$ and $y = \cos 2x$ **d** $y = \tan x$ and $y = 2 + \tan x$

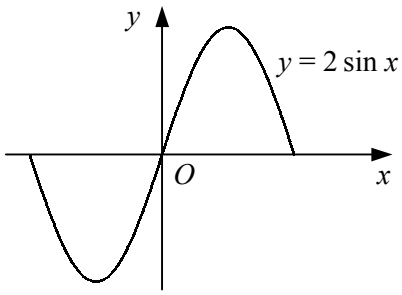
e $y = \sin x$ and $y = -\sin x$ **f** $y = \cos x$ and $y = \cos (x + 60°)$

g $y = \tan x$ and $y = \tan \frac{1}{2}x$ **h** $y = \sin x$ and $y = 1 + \sin x$

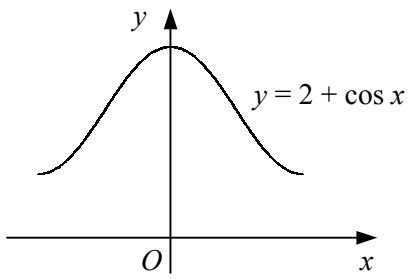
9 Each curve is shown for the interval $-180° \leq x \leq 180°$.

Write down the coordinates of the turning points of each curve in this interval.

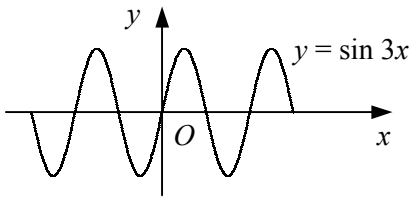
a



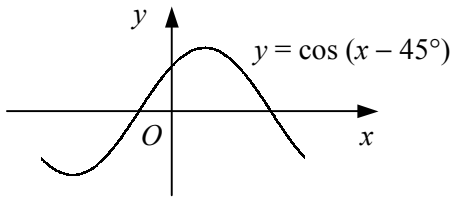
b



c



d



10 Write down the period of each of the following graphs.

a $y = \sin x°$ **b** $y = \tan x°$ **c** $y = 2 \cos x°$

d $y = \sin 2x°$ **e** $y = \tan (x + 30)°$ **f** $y = \cos \frac{1}{3}x°$

11 Sketch each of the following curves for x in the interval $0 \leq x \leq 360$. Show the coordinates of any points of intersection with the coordinate axes and the equations of any asymptotes.

a $y = \tan x°$ **b** $y = \cos (x + 30)°$ **c** $y = \sin 2x°$

d $y = 1 + \cos x°$ **e** $y = \sin \frac{1}{2}x°$ **f** $y = \tan (x + 90)°$

g $y = \sin (x - 45)°$ **h** $y = -\tan x°$ **i** $y = \cos (x - 120)°$

12 Sketch each of the following curves for x in the interval $0 \leq x \leq 2\pi$. Show the coordinates of any turning points and the equations of any asymptotes.

a $y = \cos x$ **b** $y = 3 \sin x$ **c** $y = \tan 2x$

d $y = \sin (x - \frac{\pi}{3})$ **e** $y = \cos \frac{1}{3}x$ **f** $y = \sin x - 2$

g $y = \tan (x + \frac{\pi}{4})$ **h** $y = \sin \frac{3}{4}x$ **i** $y = \cos (x - \frac{\pi}{6})$