Now Revise

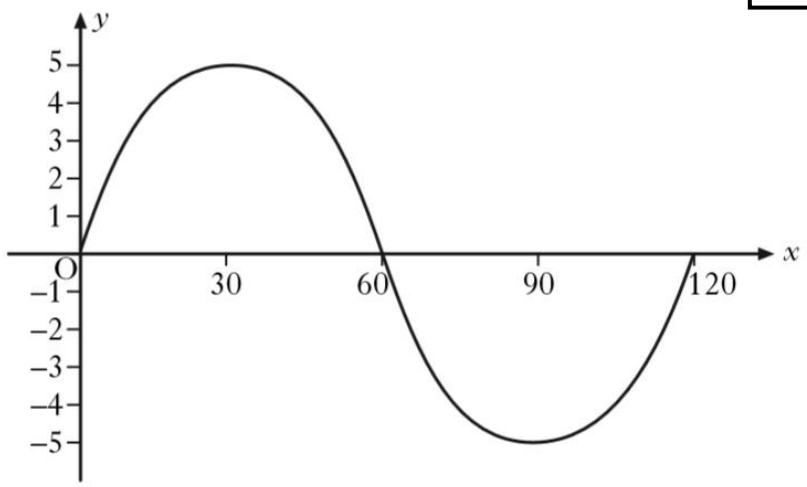
Routine – Non Calculator

Trig Skills

Relationships 1.5

1

Part of the graph of $y = a \sin bx°$ is shown in the diagram.



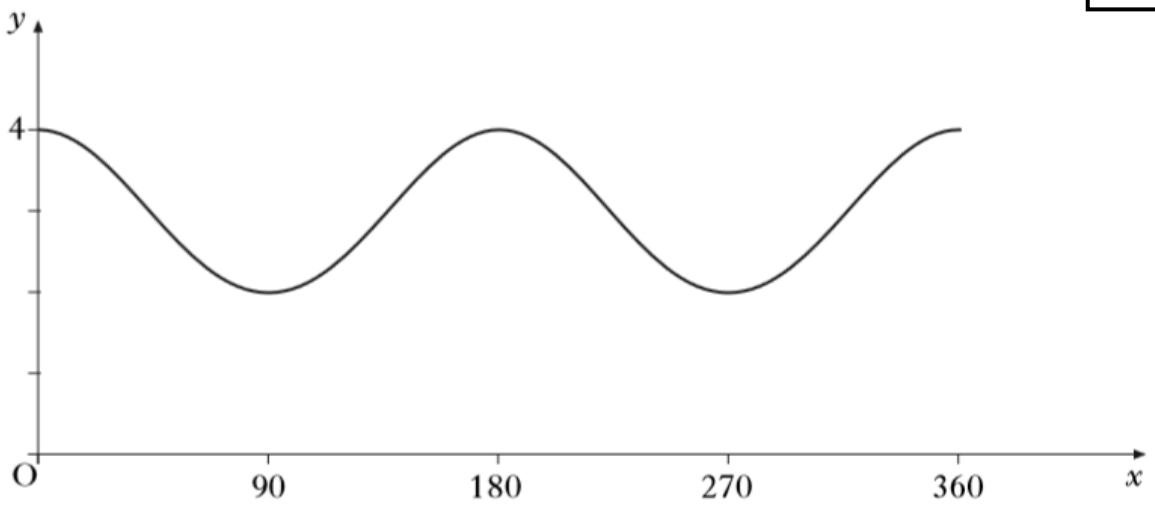
State the values of a and b.

2

Sketch the graph of $y = -2 \sin x°$, $0 \leq x \leq 360$.

3

Part of the graph of $y = \cos bx^\circ + c$ is shown below.



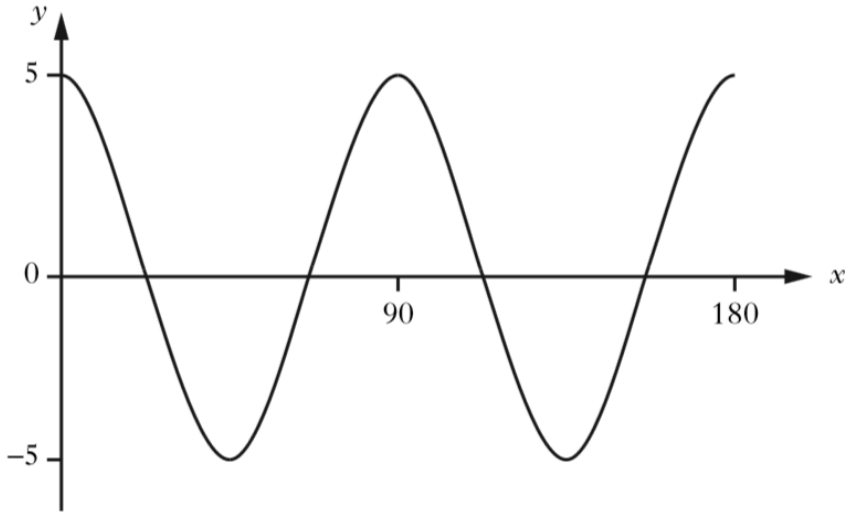
Write down the values of b and c.

4

Sketch the graph of $y = 4\cos 2x^\circ, \quad 0 \leq x \leq 360$.

5

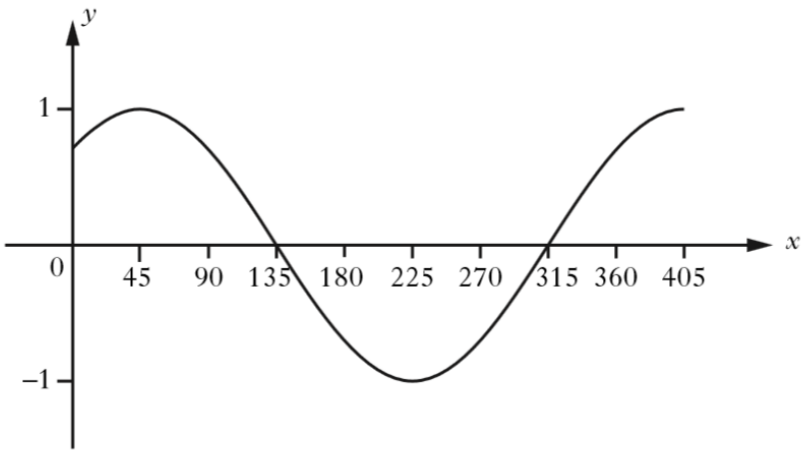
Part of the graph of $y = a\cos bx^\circ$ is shown in the diagram.



State the values of a and b.

6 If $\sin x° = \frac{4}{5}$ and $\cos x° = \frac{3}{5}$, calculate the value of $\tan x°$.

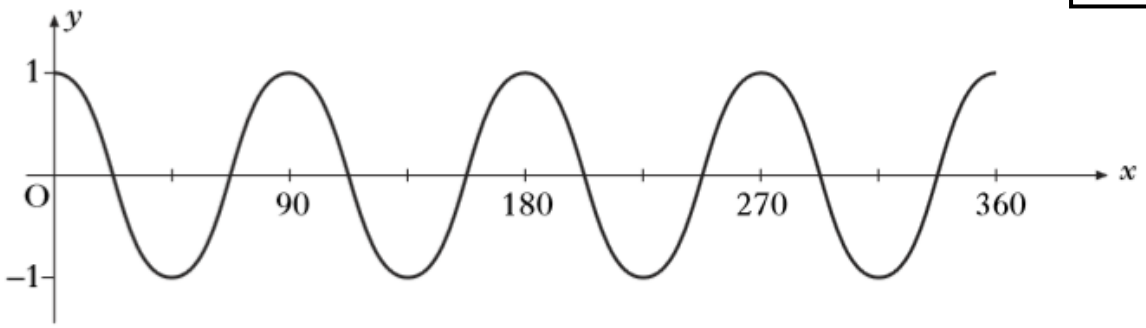
7 The graph shown below has an equation of the form $y = \cos(x - a)°$.



Write down the value of a.

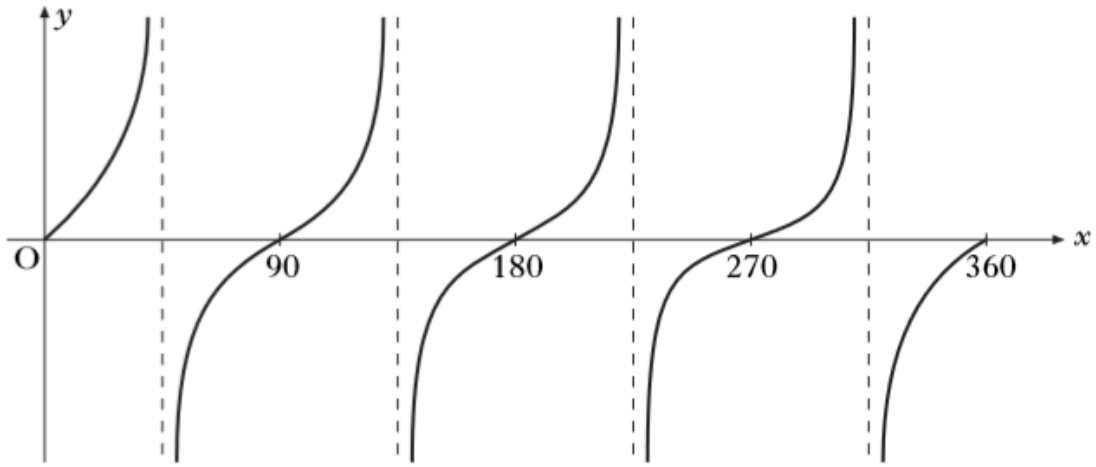
(*a*) Part of the graph of $y = \cos ax°$ is shown below.

8



State the value of a.

(*b*) Part of the graph of $y = \tan bx°$ is shown below.



State the value of b.

Given that

9

$$\cos 60° = 0{\cdot}5,$$

what is the value of $\cos 240°$?

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Solve the equation

$$5\tan x° - 6 = 2, \qquad 0 \le x < 360.$$

10

Solve the equation

$$4\cos x° + 3 = 0, \qquad 0 \le x \le 360.$$

11

Solve the equation

$$7\sin x° + 1 = -5, \qquad 0 \le x \le 360.$$

12

Solve the equation

$$2\tan x° - 3 = 5, \qquad 0 \le x \le 360.$$

13

Solve the equation $5\cos x° - 3 = 1,\ 0 \le x \le 360.$

14

Solve **algebraically** the equation

$$5\cos x° + 4 = 0, \qquad 0 \le x < 360.$$

15

Now Revise

Unseen and Non Routine

Trig Skills

Relationships 1.5

An angle, $a°$, can be described by the following statements.

- a is greater than 0 and less than 360
- $\sin a°$ is negative
- $\cos a°$ is positive
- $\tan a°$ is negative

16

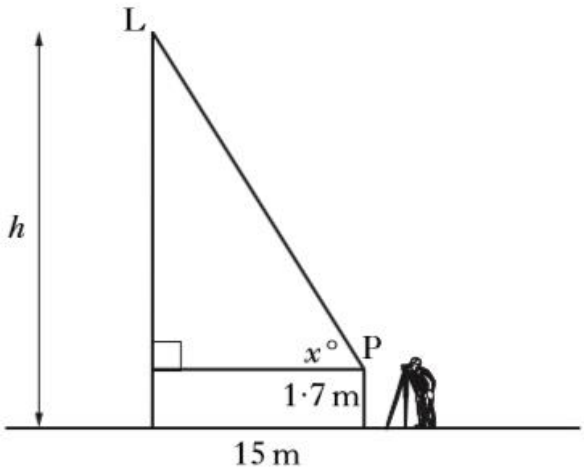
Write down a possible value for a.

Simplify $\dfrac{\cos x° \ \tan x°}{\sin x°}$.

17

In the diagram below, the point L represents the lift.

18



The height, h metres, of the lift above the ground is given by the formula

$$h = 15 \tan x° + 1{\cdot}7,$$

where $x°$ is the angle of elevation of the lift from the surveyor at point P.

(*a*) What is the height of the lift above the ground when the angle of elevation from P is 25 °?

(*b*) What is the angle of elevation at point P when the height of the lift above the ground is 18·4 metres?

19 Prove that $\dfrac{\sin^2 A}{1-\sin^2 A} = \tan^2 A.$

20 The depth of water, D metres, in a harbour is given by the formula

$$D = 3 + 1{\cdot}75 \sin 30h^\circ$$

where h is the number of hours after midnight.

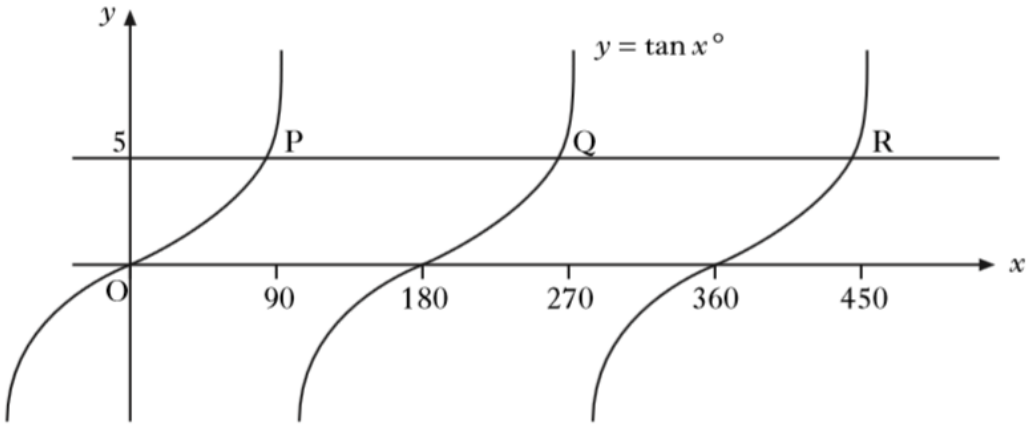
(*a*) Calculate the depth of water at 5 am.

(*b*) Calculate the maximum difference in depth of the water in the harbour.

Do not use a trial and improvement method.

21 The diagram shows part of the graph of $y = \tan x°$.

The line $y = 5$ is drawn and intersects the graph of $y = \tan x°$ at P and Q.

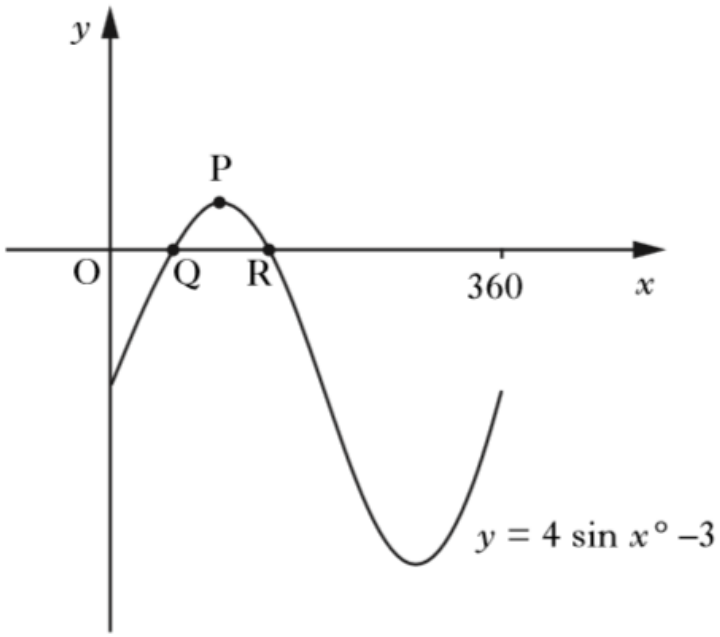


(*a*) Find the x-coordinates of P and Q.

(*b*) Write down the x-coordinate of the point R, where the line $y = 5$ next intersects the graph of $y = \tan x°$.

Part of the graph of $y = 4 \sin x° - 3$ is shown below.

22



The graph cuts the x-axis at Q and R.

P is the maximum turning point.

(*a*) Write down the coordinates of P.

(*b*) Calculate the x-coordinates of Q and R.

$f(x) = 3 \sin x°, \qquad 0 \leq x < 360$

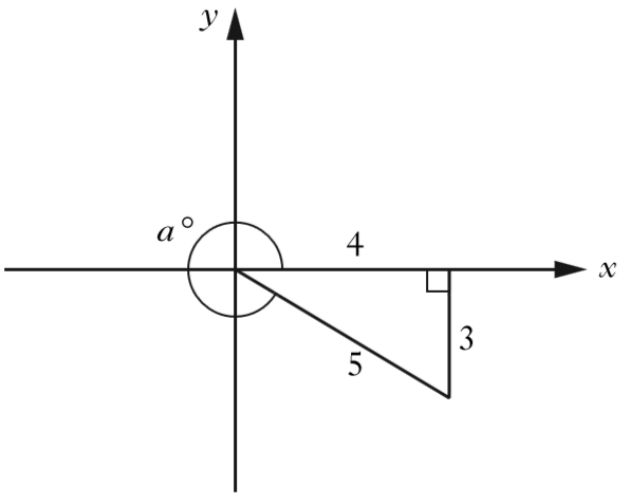
23

(*a*) Find $f(270)$.

(*b*) $f(t) = 0{\cdot}6$.

Find the two possible values of t.

24



Write down the value of $\cos a°$.

25

Simplify

$$\frac{\cos^3 x°}{1-\sin^2 x°}.$$