



National 5 Mathematics

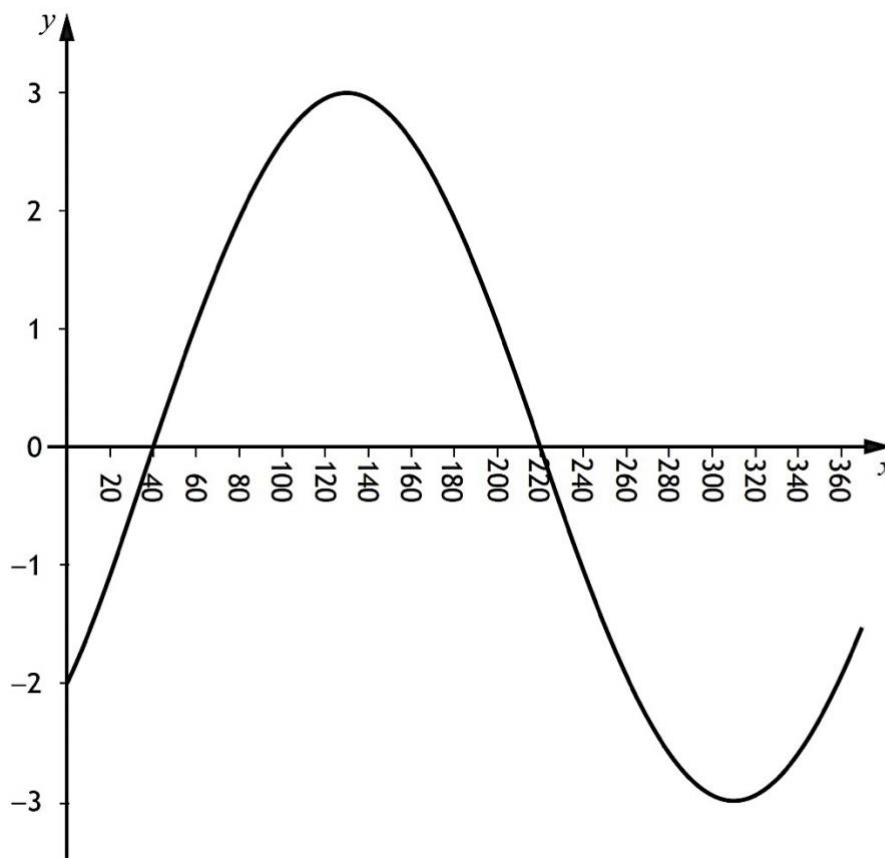
Trigonometry - Questions

Note that 'Trigonometry' is a different topic from 'Using Trigonometry' which includes the Sine and Cosine Rules, and bearings.

Marks are indicated in brackets after each question number

2014 Paper 1 Question 10, (2)

The graph of $y = a \sin(x+b)^\circ$, $0 \leq x \leq 360$, is shown below.



Write down the values of a and b .

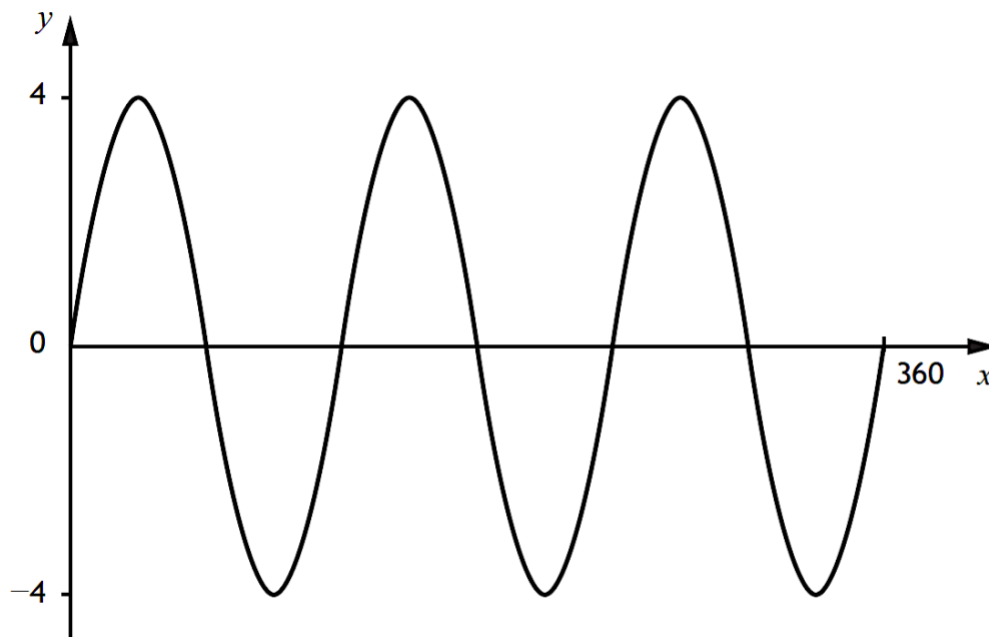
2014 Paper 2 Question 12, (3)

Solve the equation $11\cos x^\circ - 2 = 3$, for $0 \leq x \leq 360$.



2015 Paper 1 Question 6, (2)

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



State the values of a and b .

2015 Paper 1 Question 9, (2)

Write the following in order of size starting with the smallest.

$$\cos 90^\circ \quad \cos 100^\circ \quad \cos 300^\circ$$

Justify your answer.

2016 Paper 1 Question 11, (2)

Simplify

$$\tan^2 x^\circ \cos^2 x^\circ .$$

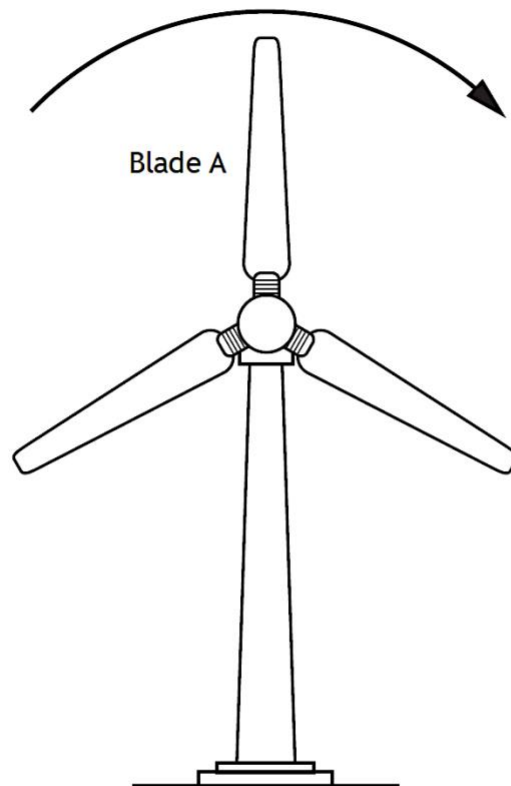
2016 Paper 2 Question 14, (3)

Solve the equation $2 \tan x^\circ + 5 = -4$, for $0 \leq x \leq 360$.



2017 Paper 2 Question 15, (1) (1) (4)

A wind turbine has three blades as shown below.



The height, h metres, of the tip of blade A above the ground in each rotation is given by

$$h = 40 + 23 \cos x^\circ, \quad 0 \leq x < 360$$

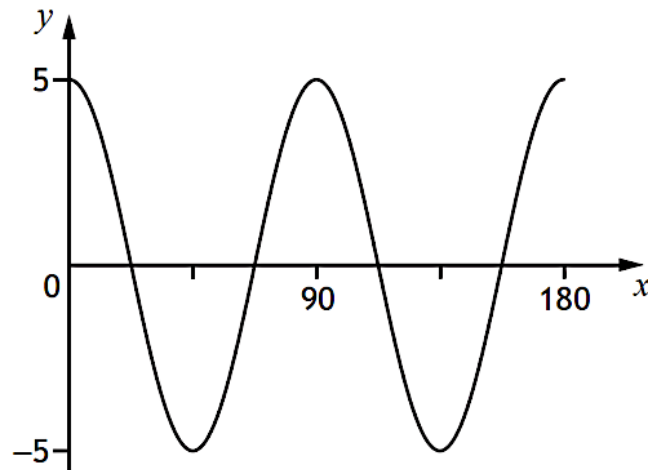
where x is the angle blade A has turned clockwise from its vertical position.

- Calculate the height of the tip of blade A after it has turned through an angle of 60° .
- Find the minimum height of the tip of blade A above the ground.
- Calculate the values of x for which the tip of blade A is 61 metres above the ground.



2018 Paper 1 Question 6, (2)

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



State the values of a and b .

2018 Paper 1 Question 12, (1)

Given that $\cos 60^\circ = 0.5$, state the value of $\cos 240^\circ$.

2018 Paper 1 Question 18, (2)

Express $\sin x^\circ \cos x^\circ \tan x^\circ$ in its simplest form.

Show your working.

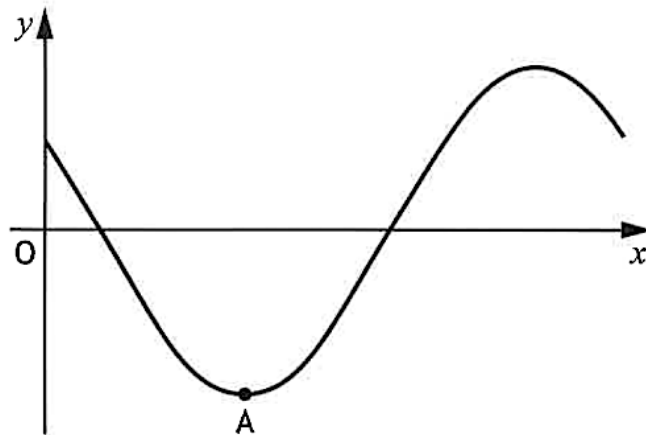
2018 Paper 2 Question 8, (3)

Solve the equation $7 \sin x^\circ + 2 = 3$, for $0 \leq x < 360$.



2019 Paper 1 Question 13, (2)

Part of the graph of $y = 3 \cos(x + 45)^\circ$ is shown in the diagram.



The graph has a minimum turning point at A.
State the coordinates of A.

2019 Paper 2 Question 14, (3)

Solve the equation $5 \cos x^\circ + 2 = 1$, $0 \leq x < 360$.

2019 Paper 2 Question 17, (2)

Expand and simplify

$$(\sin x^\circ + \cos x^\circ)^2.$$

Show your working.

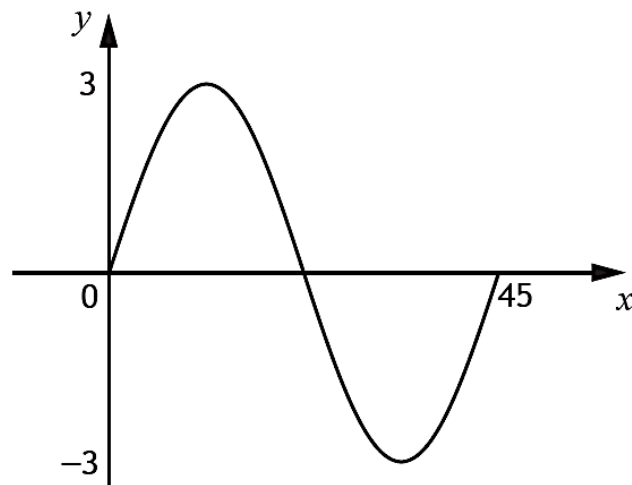
2022 Paper 2 Question 9, (3)

Solve the equation $3 \sin x^\circ + 4 = 6$, for $0 \leq x \leq 360$.



2022 Paper 1 Question 8, (1) (1)

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



(a) State the value of a .

(b) State the value of b .

2022 Paper 2 Question 13, (2)

Simplify $\frac{\sin x^\circ + 2 \cos x^\circ}{\cos x^\circ}$.

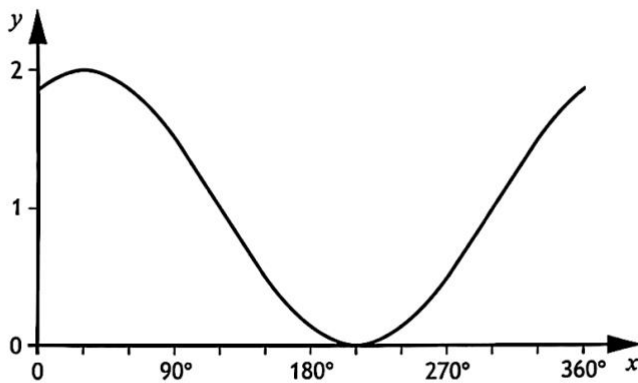
2023 Paper 1 Question 11, (1)

Given that $\sin 30^\circ = 0.5$, state the value of $\sin 330^\circ$.



2023 Paper 1 Question 13, (1) (1)

Part of the graph of $y = \cos(x + a)^\circ + b$ is shown.

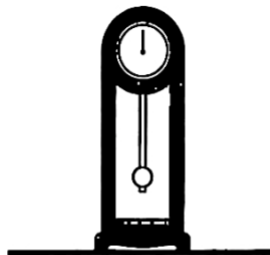


(a) State the value of a .

(b) State the value of b .

2023 Paper 2 Question 11, (4)

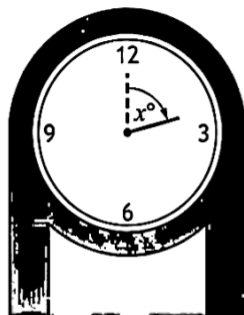
Anna has a grandfather clock in her house.



The height of the tip of the hour hand above the floor, in centimetres, is given by

$$h = 20 \cos x^\circ + 147$$

where x° is the angle the hour hand has rotated through since 12 o'clock.



Calculate the first two values of x for which the tip of the hour hand is 150 centimetres above the floor.



2023 Paper 2 Question 13, (2)

Simplify $2\sin^2 x^\circ + 2\cos^2 x^\circ$.

Show your working.