SQA Past paper questions

2024 - Paper 2 - Question 11

Solve the equation $17\sin x° + 1 = 9$, for $0 \leq x < 360$. **3**

Click here for video solution.

2024 - Paper 2 - Question 16

Express $3\cos^2 x° - 1$ in the form $a + b\sin^2 x°$.

Show your working. **2**

Click here for video solution.

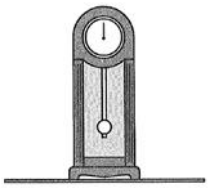
2023 - Paper 2 - Question 11

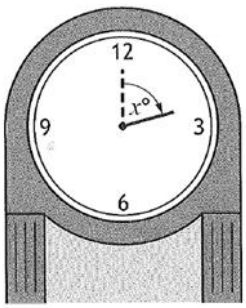
Anna has a grandfather clock in her house.

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

$$h = 20\cos x° + 147$$

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. **4**

Click here for video solution.

2023 - Paper 2 - Question 13

Simplify $2\sin^2 x° + 2\cos^2 x°$.

Show your working. **2**

Click here for video solution.

2022 - Paper 2 - Question 9

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

Click here for video solution.

2022 - Paper 2 - Question 13

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

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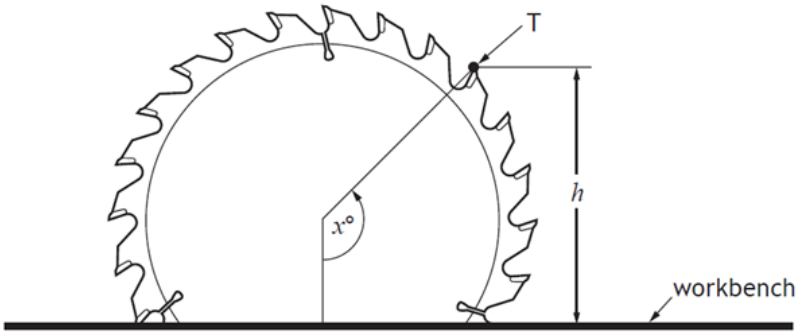
2021 - Paper 2 - Question 14

The diagram shows the part of the blade of a circular saw above a workbench.



As the blade rotates, the height, h millimetres, of point T above the workbench is given by

$$h = 57 - 85\cos x^\circ$$

where x is the angle the blade has turned anti-clockwise from a starting position.

(a) Calculate the value of x when point T is first at a height of 115 millimetres above the workbench. 3

(b) Calculate the value of x when point T is next at this height. 1

Click here for video solution.

2021 - Paper 2 - Question 16

Expand and simplify

$$\cos x^\circ \left(\tan x^\circ + 1\right).$$

Show your working. 2

Click here for video solution.

2019 - Paper 2 - Question 14

Solve the equation $5\cos x^\circ + 2 = 1, \quad 0 \leq x < 360.$ 3

Click here for video solution.

2019 - Paper 2 - Question 17

Expand and simplify

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

Show your working. 2

Click here for video solution.

2018 - Paper 1 - Question 18

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

Show your working. 2

Click here for video solution.

2018 - Paper 2 - Question 8

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

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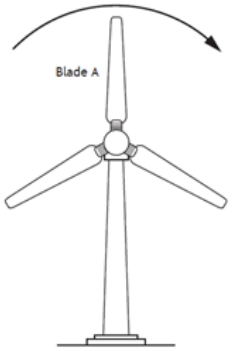
2017 - Paper 2 - Question 15



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

$$h = 40 + 23\cos x°, \qquad 0 \leq x < 360$$

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

(a) Calculate the height of the tip of blade A after it has turned through an angle of 60°. 1

(b) Find the minimum height of the tip of blade A above the ground. 1

(c) Calculate the values of x for which the tip of blade A is 61 metres above the ground. 4

Click here for video solution.

2016 - Paper 1 - Question 11

Simplify

$$\tan^2 x° \cos^2 x° .$$

Show your working. 2

Click here for video solution.

2016 - Paper 2 - Question 14

Solve the equation $2\tan x° + 5 = -4$, for $0 \leq x \leq 360$. 3

Click here for video solution.

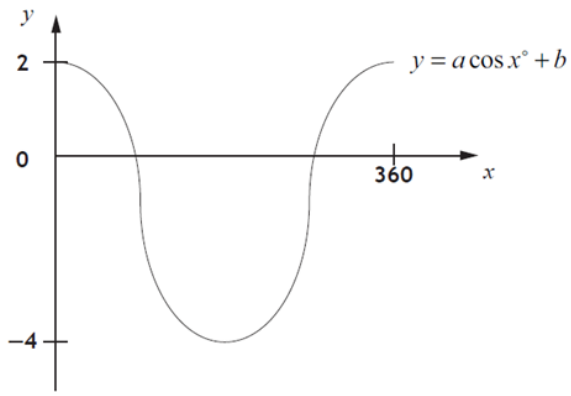
2014 - Paper 2 - Question 12

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

Click here for video solution.

Specimen - Paper 2 - Question 10

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



(a) Explain how you can tell from the graph that $a = 3$ and $b = -1$. **2**

(b) Calculate the x-coordinates of the points where the graph cuts the x-axis. **4**

Click here for video solution.