

Solving Equations

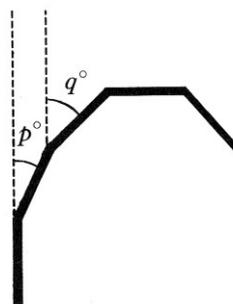
- Solve the equation $3 \tan x^\circ + 5 = 0$, for $0 \leq x \leq 360$. 4 KU
- Solve **algebraically** the equation $2 + 3 \sin x^\circ = 0$ for $0 \leq x \leq 360$ 3 KU
- Solve **algebraically**, the equation $7 \cos x^\circ - 2 = 0$ for $0 \leq x \leq 360$ 3 KU
- Solve **algebraically**, the equation $5 \tan x - 9 = 0$, for $0 \leq x \leq 360$ 3 KU
- Solve the equation $5 \sin x^\circ + 2 = 0$, for $0 \leq x \leq 360$ 3 KU
- Solve algebraically the equation: $\tan 40^\circ = 2 \sin x^\circ + 1$ $0 \leq x \leq 360$ 3 KU

- The diagram opposite shows part of a natural crystal of topaz.

The relationship between the angles marked p° and q° is

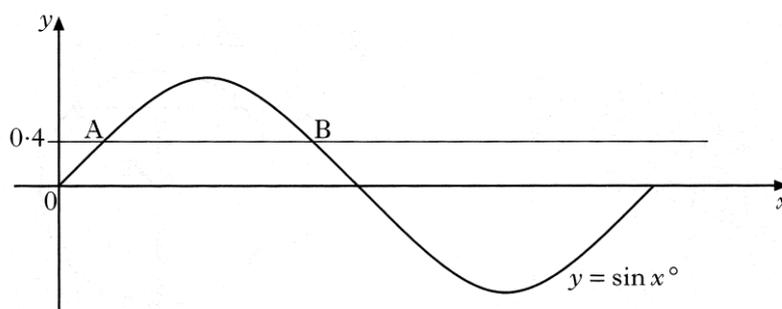
$$2 \tan p^\circ = \tan q^\circ$$

Find the value of q when $p = 24$.



3 KU

- The diagram shows part of the graph of $y = \sin x$.



The line $y = 0.4$ is drawn and cuts the graph of $y = \sin x$ at A and B.

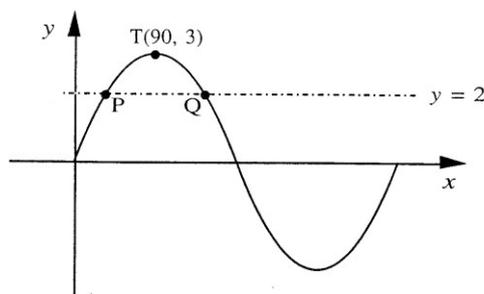
Find the x -coordinates of A and B.

3 RE

- The graph shown has equation $y = a \sin bx^\circ$.

It has a maximum at the point T(90, 3).

- Write down the values of a and b . 1 KU



Also shown in the figure is the line with equation $y = 2$, which meets the curve at the points P and Q.

- Find the x -coordinate of the point Q.

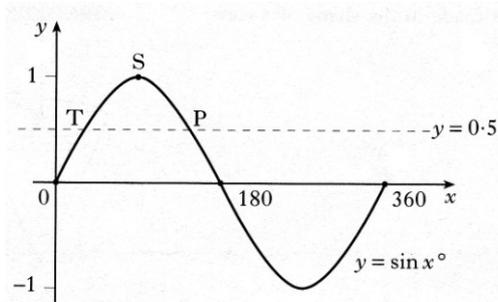
3 RE

10. The diagram shows the graph of $y = \sin x^\circ$, $0 \leq x \leq 360$

- a) Write down the coordinates of point S.

The straight line $y = 0.5$ cuts the graph at T and P.

- b) Find the coordinates of T and P.



1 KU

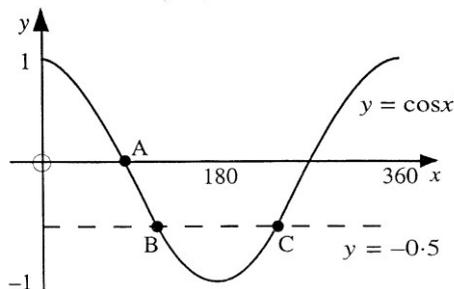
2 KU

11. The diagram shows the graph of $y = \cos x^\circ$, $0 \leq x \leq 360$.

- a) Write down the coordinates of point A.

The straight line $y = -0.5$ cuts the graph at B and C.

- b) Find the coordinates of B and C.



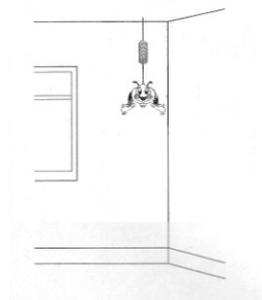
1 KU

3 KU

12. A toy is hanging by a spring from the ceiling. Once the toy is set moving, the height, H metres, of the toy above the floor is given by the formula

$$h = 1.9 + 0.3 \cos(30t)^\circ$$

t seconds after starting to move.



- a) State the maximum value of H .
 b) Calculate the height of the toy above the floor after 8 seconds.
 c) When is the height of the toy first 2.05 metres above the floor?

1 KU

3 RE

3 RE

13. The volume of water, V millions of gallons, stored in a reservoir during any month is to be predicted by using the formula

$$V = 1 + 0.5 \cos(30t)^\circ$$

where t is the number of the month. (For January $t = 1$, February $t = 2 \dots$)

- a) Find the volume of water in the reservoir in October.
 b) The local council would need to consider water rationing during any month in which the volume of water stored is likely to be less than 0.55 million gallons.

3 RE

Will the local council need to consider water rationing?

Justify your answer.

4 RE