Revision F5 (Topics 20-21) [35]

1.

Solve the equation

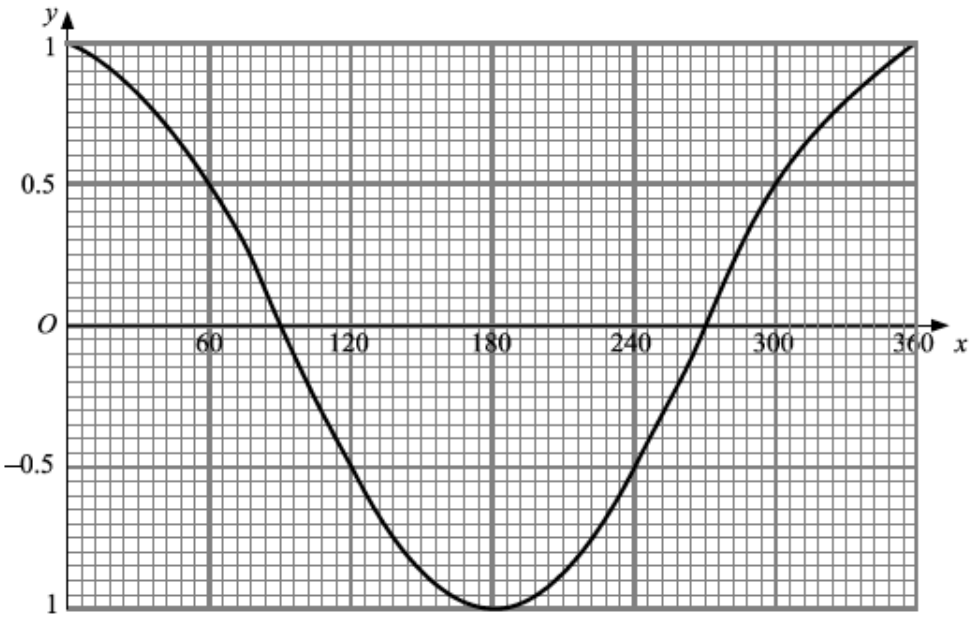
$$x^2 - 10x - 5 = 0$$

Give your answers to 2 decimal places.

(Total 3 marks)

2.

Here is a sketch of the curve $y = \cos x°$ for $0 \leqslant x \leqslant 360$



a) Use the graph to find estimates of the solutions, in the interval $0 \leqslant x \leqslant 360$, of the equation:

i) $\cos(x) = -0.4$ (2)

ii) $4\cos(x) = 3$ (2)

(Total 4 marks)

3.

(a) Find the values of a and b such that

$$x^2 + 10x + 40 = (x + a)^2 + b$$

(2)

(b) Hence, or otherwise, write down the minimum value of $x^2 + 10x + 40$

(1)

(Total 3 marks)

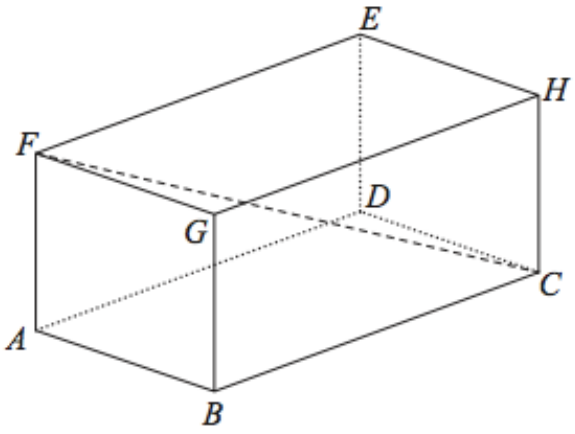
4. (a) A circle its centre at the origin and its circumference is 20π cm. Find the equation of the circle. (3)

(b) Another circle also has its centre at the origin. The line $10x + py = q$ is tangent to this circle at the point $(5,\ 4)$. Find the values of p and q. (5)

(Total 8 marks)

5.

The diagram shows a cuboid *ABCDEFGH*.



AB = 7 cm, *AF* = 5 cm and *FC* = 15 cm.

Calculate the volume of the cuboid.
Give your answer correct to 3 significant figures.

(Total 4 marks)

6.

Solve the simultaneous equations

$$x^2 + y^2 = 16$$

$$y = 3x - 1$$

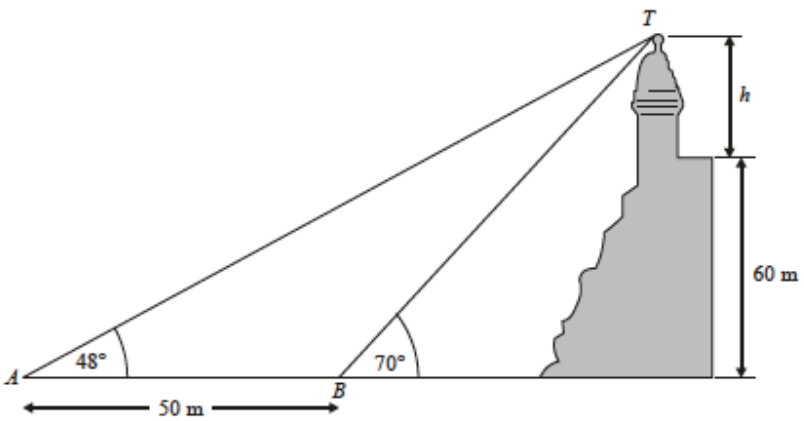
Give your answers to an accuracy of 2 decimal places.

(Total 7 marks)

7.

Zoe wants to find the height of a tower on top of a cliff.
From point *A* she measures the angle of elevation of the top of the tower, *T*, as 48°.
She then walks 50 metres horizontally towards the tower to a point *B*, where the angle of elevation of *T* is 70°.
The height of the cliff is 60 metres.

Not drawn accurately



Calculate the height, *h*, of the tower.

(Total 6 marks)