



Practice Paper D

Paper 1 – Non-Calculator

Total Marks – 50

Attempt ALL questions.

You not may use a calculator.

Full credit will only be given to solutions which contain appropriate working.

State the units for your answers where appropriate

Write your answers clearly in the space provided in this booklet.

FORMULAE LIST

The roots of $ax^2 + bx + c = 0$ are $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Sine Rule: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule: $a^2 = b^2 + c^2 - 2bc \cos A$ or $\cos A = \frac{(b^2 + c^2 - a^2)}{2bc}$

Area of a triangle: $A = \frac{1}{2}ab \sin C$

Volume of a sphere: $V = \frac{4}{3}\pi r^3$

Volume of a cone: $V = \frac{1}{3}\pi r^2 H$

Volume of a pyramid: $V = \frac{1}{3}Ah$

Standard Deviation $s = \sqrt{\frac{\sum(x - \bar{x})^2}{n-1}}$

or $s = \sqrt{\frac{\sum x^2 - \frac{(\sum x)^2}{n}}{n-1}}$, where n is the sample size.

1. Increase 680 by 17%

2

2. Solve

$$\frac{2}{3}x + 5 = \frac{3}{4}x - 4$$

3

3. Evaluate

3

$$\frac{3}{8} \text{ of } \left(4\frac{4}{9} - 1\frac{1}{3}\right)$$

4. Solve

3

$$x^2 - 15x + 36 = 0$$

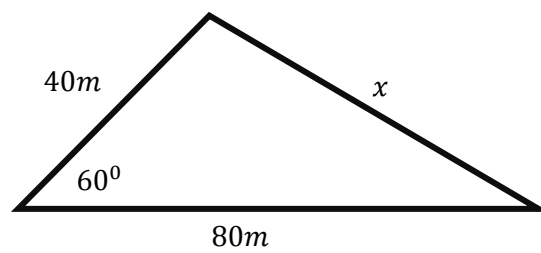
5. State the nature of the roots of the curve

3

$$y = 2x^2 + 5x + 7$$

6. Given that $\cos 60 = \frac{1}{2}$ find the exact value of x .

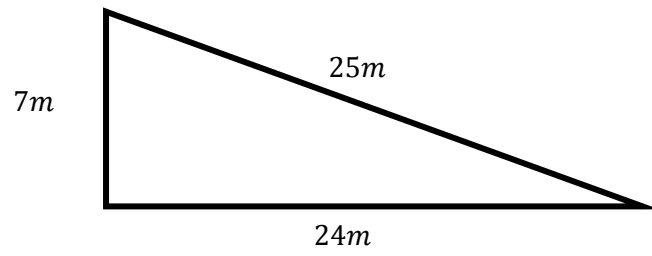
3



Given your answer as a surd in its simplest form.

7. Prove that the triangle below is right angled:

3



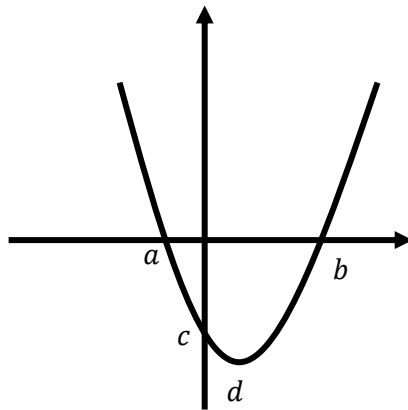
8. 20% of the staff at a department store have been made redundant.

3

There are now 3500 staff employed by the department store.

How many staff were employed prior to the redundancy?

9. The parabola below has the equation $y = x^2 - 4x - 12$.



(a) State the value of c . 1

(b) Write the equation of the parabola in the form $y = (x + p)^2 + q$. 2

(c) State the coordinates of the turning point, d . 1

(d) Given that the coordinate of a is $(-2, 0)$ state the coordinate of b . 1

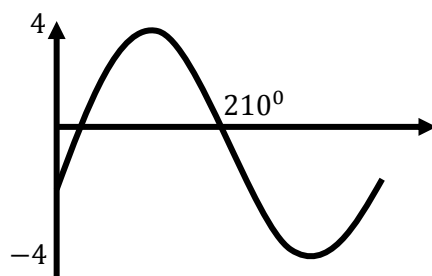
10. Write the following as a single fraction in its simplest form

3

$$\frac{3}{x+4} + \frac{7}{x+5}, \quad x \neq -4 \text{ or } x \neq -5$$

11. The graph below has the equation $y = a \sin(x - b)$

2



State the values of a and b .

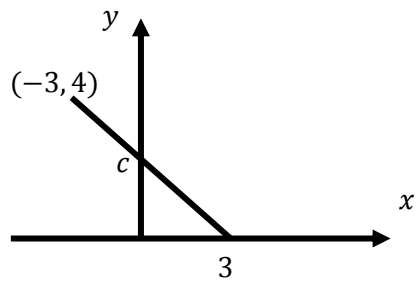
12. Two vectors, u and v , are given by

2

$$u = \begin{pmatrix} 2 \\ 4 \\ 5 \end{pmatrix}, v = \begin{pmatrix} -3 \\ 1 \\ -2 \end{pmatrix}$$

Find the resultant vector $2u + 2v$

13.



(a) Find the equation of the line.

3

(b) State the coordinates of c .

1

14. (a) Factorise $x^2 + 5x - 36$

2

(b) Hence simplify

$$\frac{3x^2 - 16}{x^2 + 5x - 36}$$

2

15. Change the subject of the formula to p

4

$$q = \frac{4p^2 - 5}{3}$$

16. Find $f(-4)$ where $f(x) = \sqrt{2x^2 + 3x}$

3

Given your answer as a surd in its simplest form.

END OF PAPER