



Practice Paper C

Paper 1 – Non Calculator

Total Marks – 50

Attempt ALL questions.

You 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. Evaluate

2

$$3\frac{2}{5} + 4\frac{1}{2}$$

2. A function, f , is defined by $f(x) = (\sqrt{7} - \sqrt{x})(\sqrt{7} + \sqrt{x})$.

3

Find $f(8)$

3. A curve has the equation $y = x^2 + 8x - 5$.

(a) Show that the curve has two real and distinct roots

2

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

2

(c) Hence or otherwise state the turning point of the curve.

1

4. Two vectors, u and v , are given by $\begin{pmatrix} 2 \\ -1 \\ 4 \end{pmatrix}$ and $\begin{pmatrix} 3 \\ 4 \\ -1 \end{pmatrix}$ respectively.

3

Find the resultant vector $3v - u$.

5. Given that $\sin 30 = \frac{1}{2}$ state the value of $\sin 210$.

1

6. Graham and Roisin's parents agree to give each child a reward for their exam results.

Graham achieved 3 A's and 2 B's and got a reward of £105.

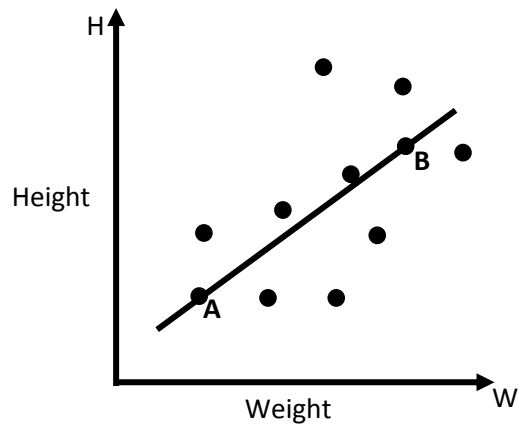
(a) Write an equation to illustrate this information. 1

Roisin achieved 2 A's and 3B's and received a reward of £95.

(b) Write an equation to illustrate this information. 1

(c) Find, algebraically, how much Graham and Roisin got for each A and each B 3

7. The following graphs shows the comparison between the height and weight of new born babies.



Baby A weighed 5 pounds and had a height of 14cm

Baby B weighed 9 pounds and had a height of 17cm

(a) Find the equation of the line of best fit in terms of W and H.

3

(b) Hence, or otherwise, use this equation to estimate the height of a baby weighing 12 pounds.

1

8. A stadium has 15% of its tickets unsold for a concert.

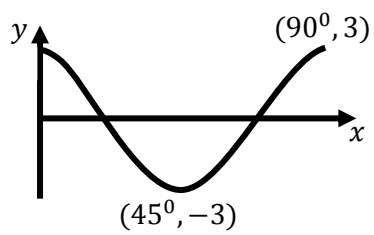
3

They have sold 51 000 tickets for the concert.

Find the capacity of the stadium.

9. Below is the graph $y = a \cos bx$ where $0 \leq x \leq 90^\circ$.

2

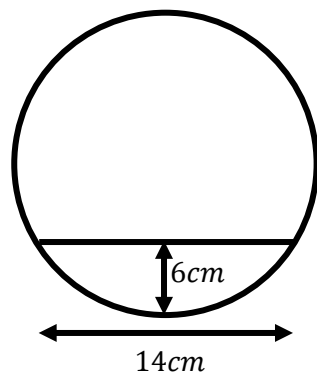


State the values of a and b .

10. A pipe is being filled with water and currently has a depth of 6cm.

3

The surface of the water across the pipe is 14cm.



Calculate the radius of the pipe.

11. (a) Simplify

$$\sqrt{80} + \sqrt{45} - \sqrt{20}$$

2

(b) Evaluate

$$49^{-\frac{3}{2}}$$

2

(c) Fully simplify

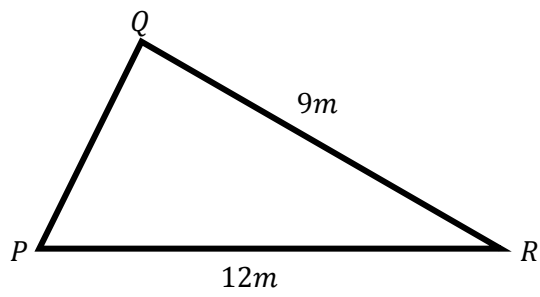
$$\frac{5x^5 + 7x^{-3}}{10x^2}$$

2

12. Given that the value of $\sin P = 0.3$

3

Find the value exact value of $\sin Q$.

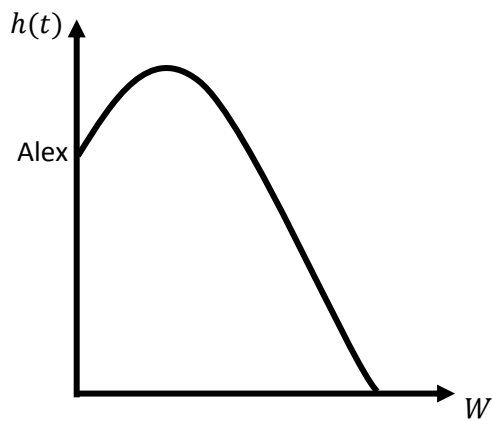


13. Change the subject of the formula to g

2

$$h = \sqrt{\frac{5g}{3}}$$

14. Alex is standing at the top of a cliff and sets off a flare.



The flare travels according to the function $h(t) = -t^2 + 12t + 160$ where $h(t)$ is the height of the flare, in metres, after t seconds.

(a) State the height of the cliff. 1

(b) After how long will the flare hit the water? 3

(c) State the maximum height the flare will reach. 2

END OF PAPER

