



Practice Paper A

Paper 2 –Calculator

Total Marks – 60

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. Expand and simplify $(2x^2 - x + 5)(x - 3)$

2

2. Evaluate

$$3\frac{6}{7} \times \frac{5}{12}$$

2

3. Write $y = x^2 + 6x - 4$ in the form $y = (x + p)^2 - q$.

2

4. State the gradient and y-intercept of the line $5x - 3y - 12 = 0$.

3

5. Solve algebraically

$$2x^2 - 7x - 5 = 0$$

Give your answer to 2 significant figures.

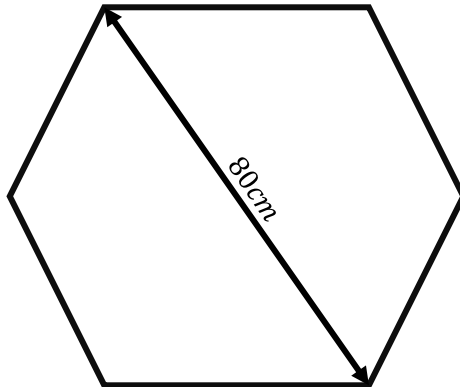
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6. A single drop of water (0.05ml) contains 2×10^{21} oxygen atoms. How many oxygen atoms will one litre of water contain?

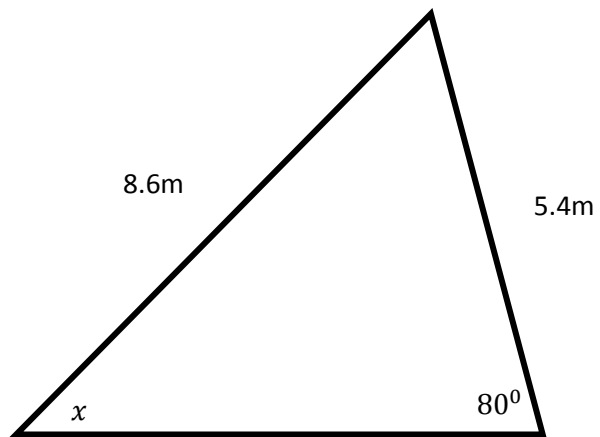
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7. The table top is in the shape of a regular hexagon. The longest distance between vertices on the table below is 80cm . Find the area of the top of the table.

4



8. Find the size of the angle x :

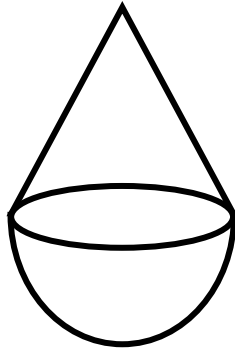


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9. State the nature of the roots of $y = 4x^2 + 20x + 25$

3

10. A paper weight is made of a cone with a height of 12cm and a hemisphere with a diameter of 7cm . Calculate the volume of the cone. Give your answer to 2 significant figures.



11. Ian invests £3000 in a his new ISA. This account pays 1.8% interest. How much will be in Ian's account in 5 years time if he does not withdraw any money.

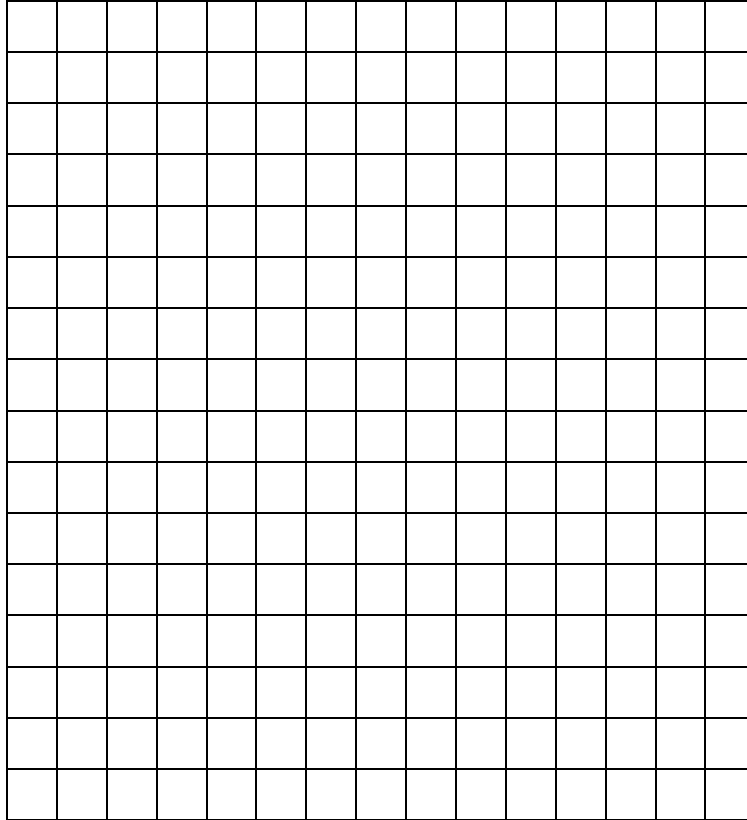
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12. Solve $3 \tan x + 4 = 6$ for $0 \leq x \leq 360^\circ$

3

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

a. Sketch $2u + v$ on the grid below



b. Find $|2u - v|$

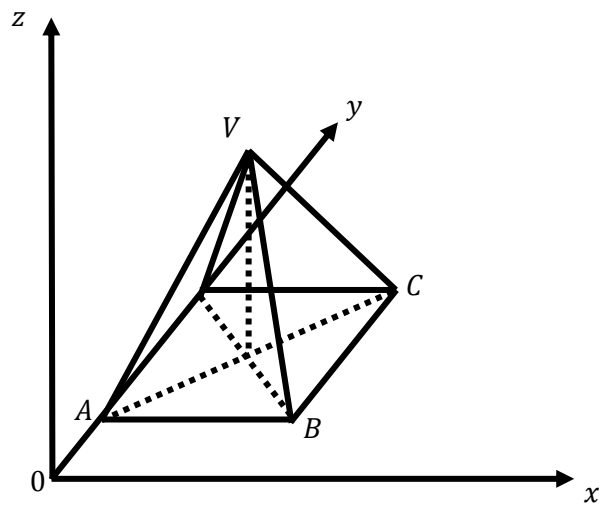
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14. Find the standard deviation of the following data set

8, 5, 9, 7, 12, 10

15. The diagram shows a regular square-based pyramid, relative to the coordinate axes.



- A is the point $(0, 3, 0)$
- B is the point $(6, 3, 0)$
- The pyramid has a height of 8 units.

(a) State the coordinates of C.

1

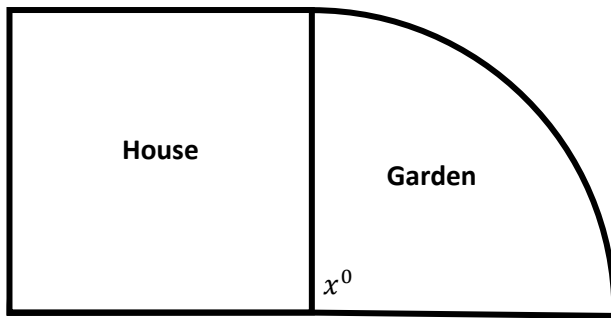
(b) State the coordinates of V.

1

(c) Calculate the length of CV.

3

16. A garden is in the shape of a sector and has an area of $63.62m^2$. The garden has a radius of $9m$.



(a) Calculate the size of angle x° .

3

The house owner wants to fence of the arc of the garden. This will cost $\pounds 25$ per metre. Fencing is bought in packs of 3 metres.

(b) Calculate the cost of fencing the arc section of the garden.

4

END OF PAPER