



PEPONI

SCHOOL

2025 VI Form Scholarship Examinations

Write your name here

Surname	Other names
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Mathematics 1

Time: 1 hour

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator.

- Use **black** ink or ball-point pen.
 - **Fill in the boxes** at the top of this page with your name.
 - Answer **all** questions.
 - Answer the questions in the spaces provided
– *there may be more space than you need.*
 - **Calculators may be used.**
 - If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.
 - Diagrams are **NOT** accurately drawn, unless otherwise indicated.
 - You must **show all your working out.**
-
- The total mark for this paper is 75
 - The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*
-
- Read each question carefully before you start to answer it.
 - Keep an eye on the time.
 - Try to answer every question.
 - Check your answers if you have time at the end.

Q1.

(a) Show that $\frac{4}{5} + \frac{2}{3} = 1\frac{7}{15}$

(2)

(b) Show that $2\frac{1}{4} \div 3\frac{1}{2} = \frac{9}{14}$

(3)

(Total for Question is 5 marks)

Q2.

(a) Simplify $y^5 \times y^9$

.....
(1)

(b) Simplify $(2m^3)^4$

.....
(2)

(c) Solve $5(x + 3) = 3x - 4$

Show clear algebraic working.

x =

(3)

(d) (i) Factorise $x^2 + 2x - 24$

.....

(2)

(ii) Hence, solve $x^2 + 2x - 24 = 0$

.....

(1)

(Total for question = 9 marks)

Q3.

$$\frac{6x^3 + 13x^2 - 5x}{4x^2 - 25}$$

Simplify fully

.....

(Total for question = 3 marks)

Q4.

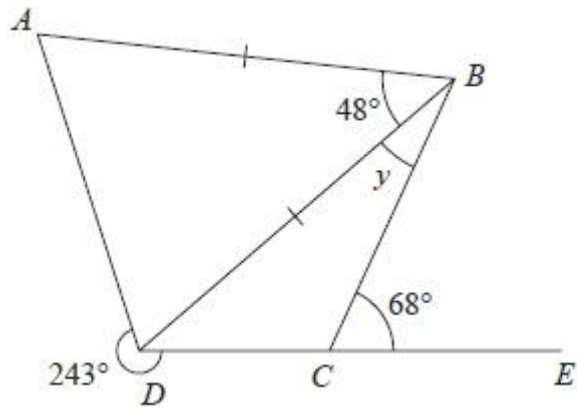


Diagram NOT
accurately drawn

ABD is an isosceles triangle with $AB = DB$.
 DCE is a straight line.

Angle $ABD = 48^\circ$
Angle $BCE = 68^\circ$
Reflex angle $ADC = 243^\circ$

Work out the size of the angle marked y .
Give a reason for each stage in your working.

o

(Total for question = 5 marks)

Q5.

The sum of the first 48 terms of an arithmetic series is 4 times the sum of the first 36 terms of the same series.

Find the sum of the first 30 terms of this series.

.....

(Total for question = 5 marks)

Q6.

$$P = \frac{a}{m - x}$$

$x = 8$ correct to 1 significant figure
 $a = 4.6$ correct to 2 significant figures
 $m = 20$ correct to the nearest 10

Calculate the lower bound of P .
Show your working clearly.

(Total for question = 4 marks)

Q7.

A bank pays compound interest of 6% per annum on its savings accounts.
Julia invests \$7500 for 3 years.

Calculate the total interest gained after 3 years.

\$

(Total for question is 3 marks)

Q8.

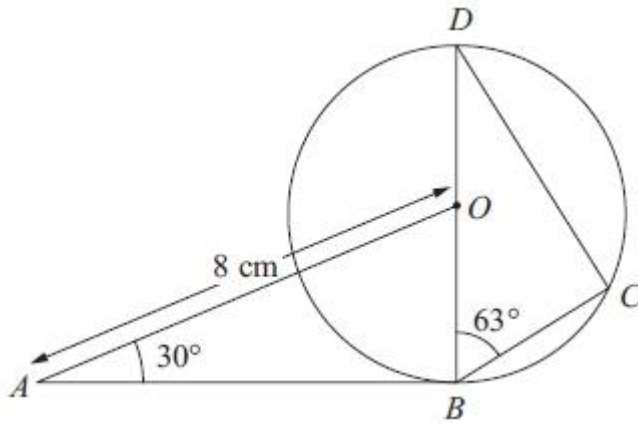


Diagram **NOT**
accurately drawn

B , C and D are points on a circle, centre O .

BOD is a diameter of the circle.

AB is the tangent to the circle at B .

$AO = 8$ cm. Angle $BAO = 30^\circ$ Angle $CBD = 63^\circ$

Calculate the length of BC .

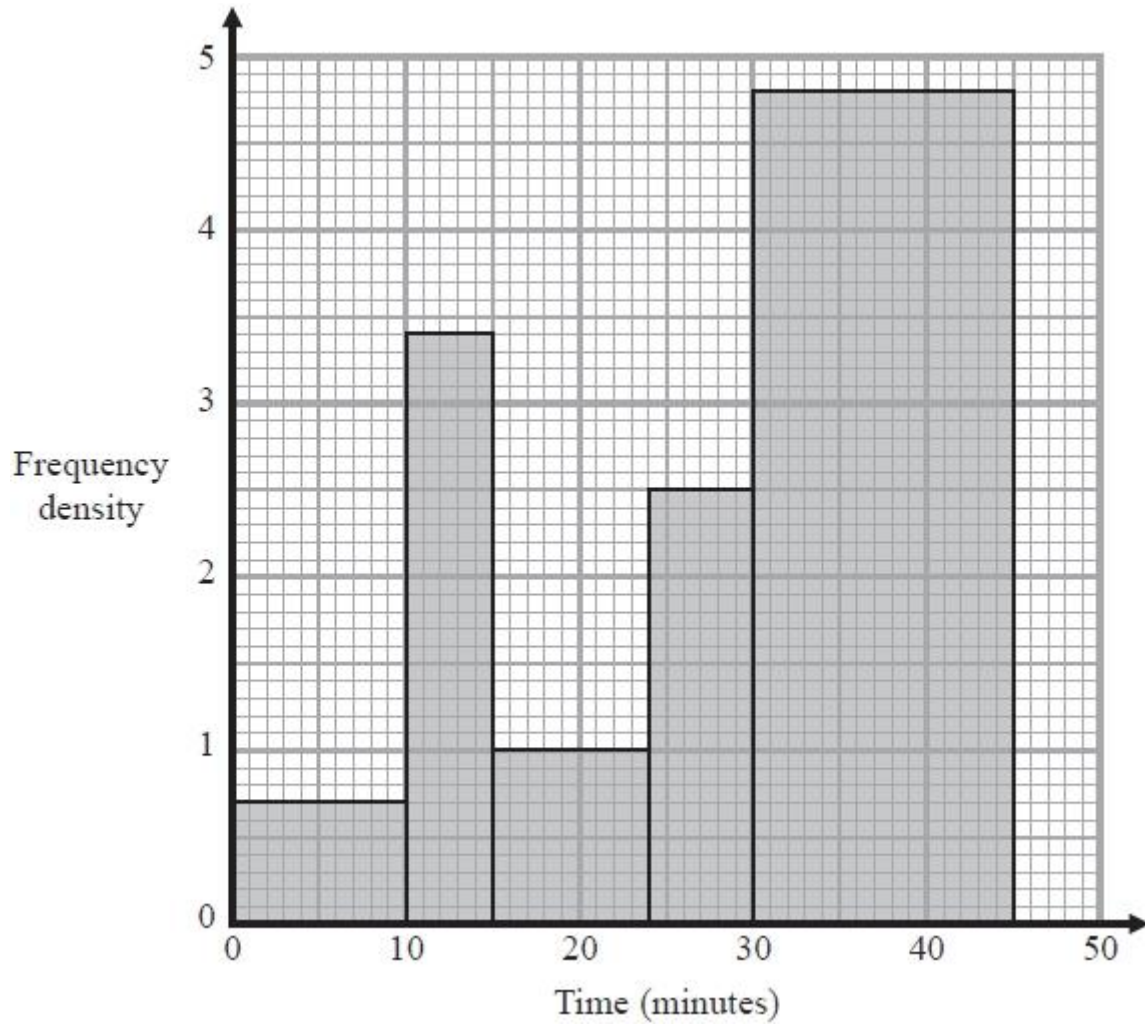
Give your answer correct to 3 significant figures.

..... cm

(Total for question = 4 marks)

Q9.

The histogram gives information about the times, in minutes, that some customers spent in a supermarket.



(a) Work out an estimate for the proportion of these customers who spent between 17 minutes and 35 minutes in the supermarket.

One of the customers is selected at random.

Given that this customer had spent more than 30 minutes in the supermarket,

(b) find the probability that this customer spent more than 36 minutes in the supermarket.

.....
(2)

(Total for question = 5 marks)

Q10.

Calvin and Jenny are planning a holiday together.

The total cost of the flights is £1190

Calvin and Jenny share the cost of the flights so that

the money that Calvin pays : the money that Jenny pays = 2 : 5

(a) How much more money does Jenny pay than Calvin?

£
(3)

The cost of the villa for their holiday is £3500

They have to pay a deposit of 12% of this cost.

The rest of the cost of the villa is to be paid in monthly instalments of £220

(b) How many monthly instalments must be paid?

.....
(3)

(Total for question = 6 marks)

Q11.

Here is the number of goals that Henri's team scored one summer in each water polo match.

5 8 9 11 13 13 14 15 16 17 20

Find the interquartile range of the numbers of goals.
Show your working clearly.

.....

(Total for question = 2 marks)

Q12.

A is inversely proportional to the square of r

$A = 5$ when $r = 0.3$

(a) Find a formula for A in terms of r

.....

(3)

(b) Find the value of A when $r = 7.5A$

$A = \dots\dots\dots$
(3)

(Total for question = 6 marks)

Q13.

The function f is such that $f(x) = 3x - 2$

(a) Find $f(5)$

$\dots\dots\dots$
(1)

The function g is such that $g(x) = 2x^2 - 20x + 9$ where $x \geq 5$

(b) Express the inverse function g^{-1} in the form $g^{-1}(x) = \dots$

$$g^{-1}(x) = \dots\dots\dots$$

(4)

(Total for question = 5 marks)

Q14.

Point *A* has coordinates (5, 8)

Point *B* has coordinates (9, -4)

(a) Work out the gradient of *AB*.

.....

(2)

The straight line **L** has equation $y = -4x + 5$

(b) Write down the gradient of a straight line that is perpendicular to **L**.

.....

(1)

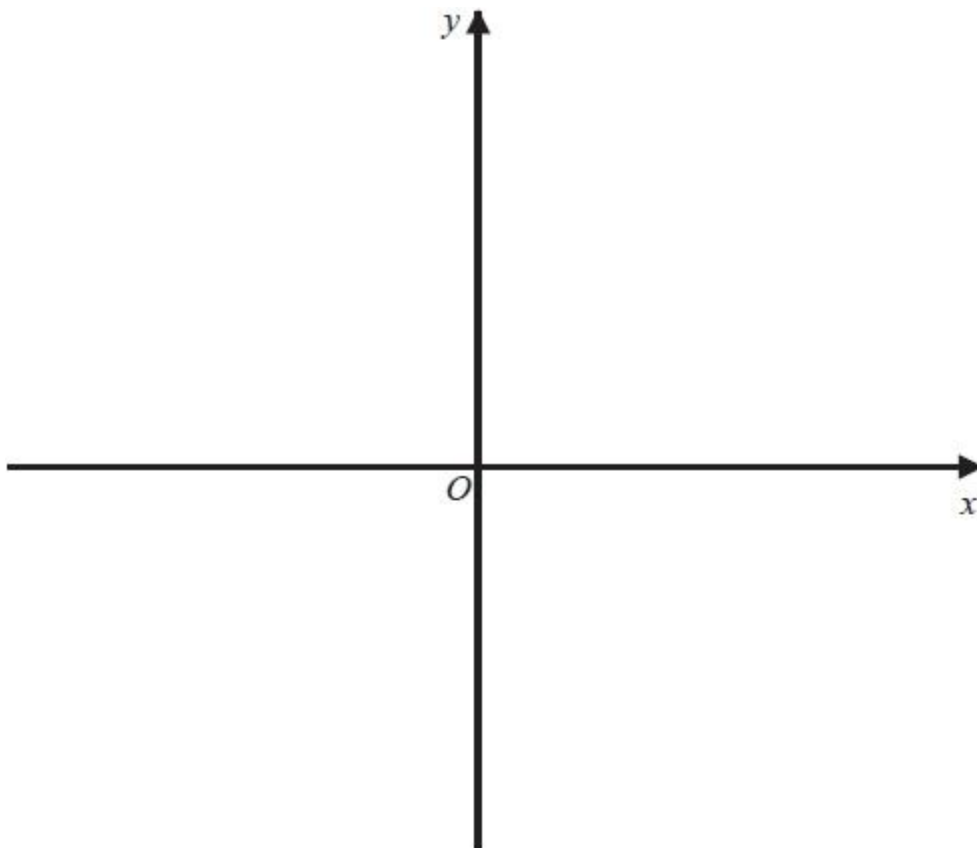
(Total for question = 3 marks)

Q15.

The curve **C** has equation $y = 4(x - 1)^2 - a$ where $a > 4$

Using the axes below, sketch the curve **C**.
On your sketch show clearly, in terms of a ,

- (i) the coordinates of any points of intersection of **C** with the coordinate axes,
- (ii) the coordinates of the turning point.



(Total for question = 4 marks)

Q16.

A target has a black circle and a white region.

Arrows can hit the black circle, the white region or miss the target.

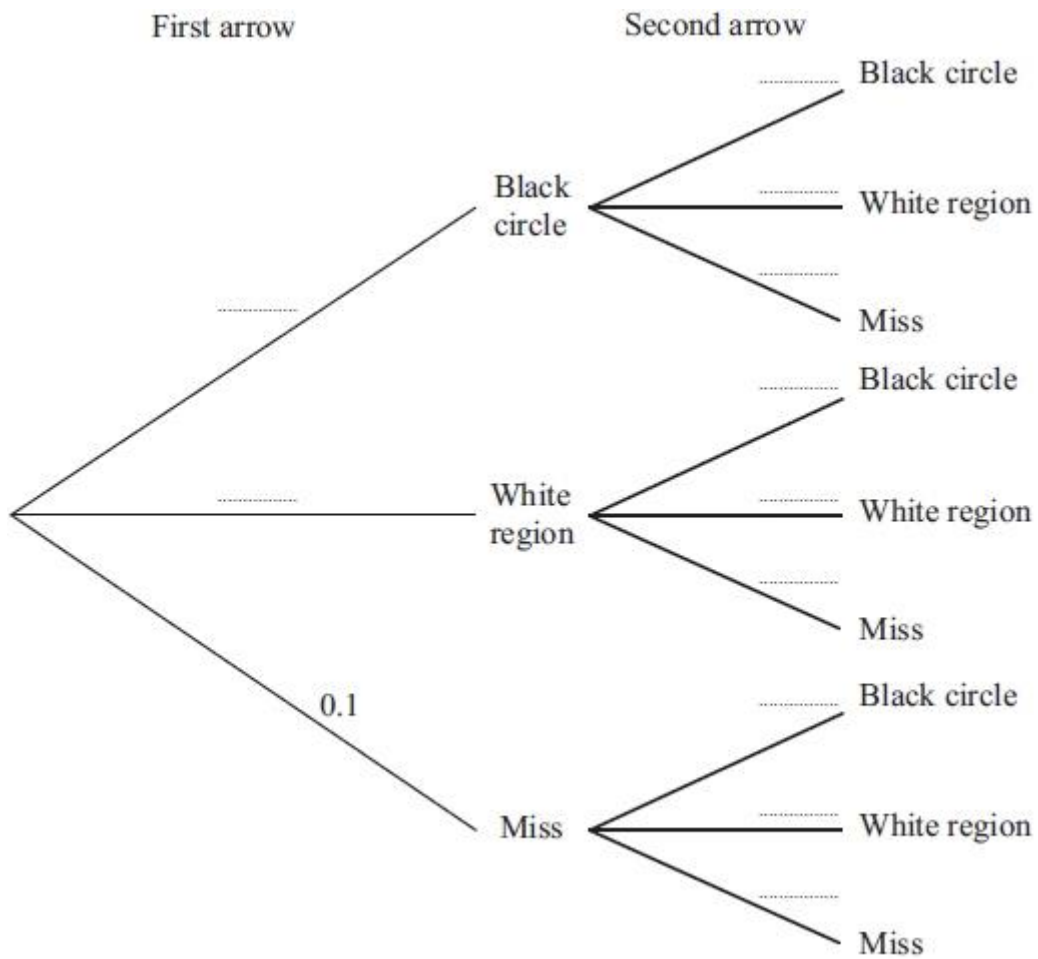


Peter shoots two arrows at the target.

On each shot, the probability that Peter's arrow misses the target is 0.1

On each shot, the probability that Peter's arrow hits the white region is twice the probability that it hits the black circle.

(a) Complete the probability tree diagram for Peter's two arrows.





(b) An arrow which hits the black circle scores 10 points.

An arrow which hits the white region scores 5 points.

An arrow which misses the target scores 0 points.

Calculate the probability that Peter scores exactly 10 points with his 2 arrows.

.....
(3)

(Total for question = 6 marks)