
Year 10 Mathematics

Mock Test – Set 1 – Gold Paper

Time Allowed: 1 Hour 30 Minutes

Total Marks: 95

27 June 2026

Calculator Allowed

Full Name of Student:

1.

The diagram shows a right-angled triangle ABC .

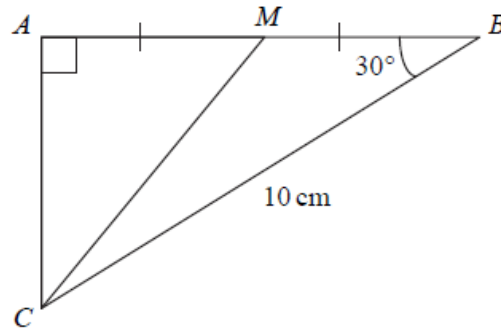


Diagram **NOT**
accurately drawn

$BC = 10 \text{ cm}$.

Angle $CAB = 90^\circ$

Angle $ABC = 30^\circ$

M is the midpoint of AB .

Work out the size of angle AMC .

Give your answer correct to 1 decimal place.

[Total for Question 1 = 4 marks]

2.

p and q are two numbers such that $p > q$

When you subtract 5 from p and subtract 5 from q the answers are in the ratio 5 : 1

When you add 20 to p and add 20 to q the answers are in the ratio 5 : 2

Find the ratio $p : q$

Give your answer in its simplest form.

.....
[Total for Question 2 = 5 marks]

3.

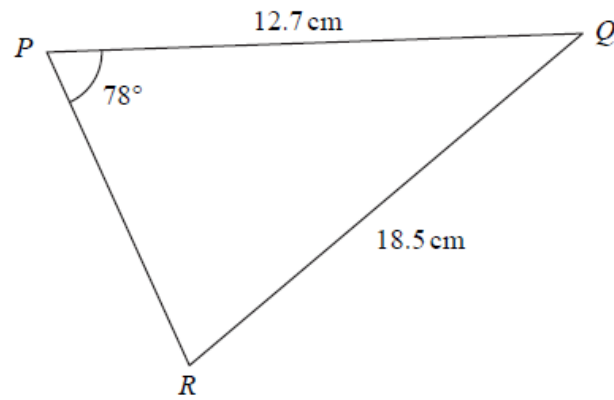


Diagram **NOT**
accurately drawn

Work out the area of triangle PQR .
Give your answer correct to 3 significant figures.

..... cm^2

[Total for Question 3 = 5 marks]

4.

$$\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$$

$$A = \{2, 3, 5, 7\}$$

$$B = \{4, 6, 8, 10\}$$

(a) Explain why $A \cap B = \emptyset$

.....

.....

.....

(1)

$$x \in \mathcal{E} \text{ and } x \notin A \cup B$$

(b) Write down the **two** possible values of x .

..... ,

(2)

Set C is such that

$$A \cup B \cup C = \mathcal{E}$$

$$A \cap C = \{2\}$$

$$B \cap C' = \{4, 6, 10\}$$

(c) List all the members of set C .

.....

(2)

[Total for Question 4 = 5 marks]

5.

Write $\frac{3\sqrt{3}}{4 - \sqrt{3}} - \frac{2}{\sqrt{3}}$ in the form $\frac{a\sqrt{3} + b}{c}$ where a , b and c are integers.

[Total for Question 5 = 4 marks]

6.

The diagram shows a right-angled triangle.

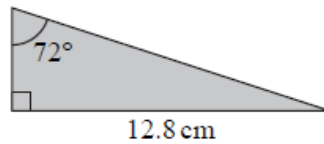


Diagram **NOT**
accurately drawn

Five of these triangles are put together to make a shape.

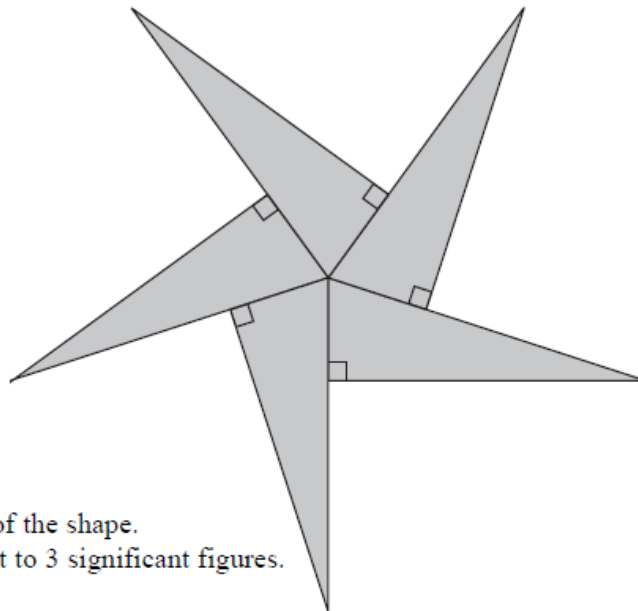


Diagram **NOT**
accurately drawn

Calculate the perimeter of the shape.
Give your answer correct to 3 significant figures.

[Total for Question 6 = 5 marks]

7.

ABC is an isosceles triangle such that

$$AB = AC$$

A has coordinates $(4, 37)$

B and C lie on the line with equation $3y = 2x + 12$

Find an equation of the line of symmetry of triangle ABC .

Give your answer in the form $px + qy = r$ where p , q and r are integers.

Show clear algebraic working.

[Total for Question 7 = 5 marks]

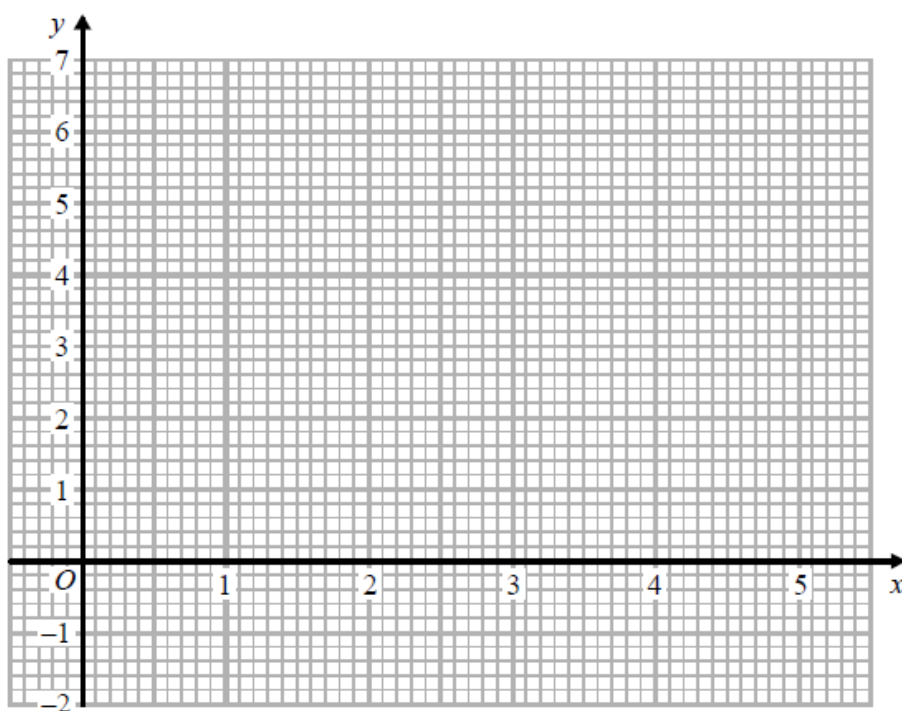
8.

(a) Complete the table of values for $y = x^2 - 5x + 6$

x	0	1	2	3	4	5
y	6		0	0	2	

(1)

(b) On the grid, draw the graph of $y = x^2 - 5x + 6$ for $0 \leq x \leq 5$



(2)

(c) By drawing a suitable straight line on the grid, find estimates for the solutions of the equation

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

(3)

[Total for Question 8 = 6 marks]

9.

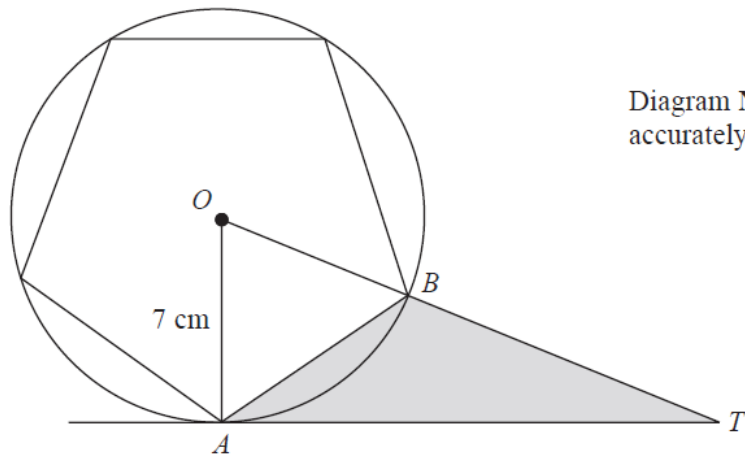


Diagram **NOT**
accurately drawn

The diagram shows a regular pentagon inside a circle, centre O .
The points A and B lie on the circle such that AB is a side of the pentagon.
 $OA = 7$ cm.
 TA is a tangent to the circle and OBT is a straight line.

Calculate the area of triangle ABT .
Give your answer correct to 3 significant figures.

..... cm²

[Total for Question 9 = 4 marks]

10.

h is inversely proportional to p

p is directly proportional to $\sqrt{t}$

Given that $h = 10$ and $t = 144$ when $p = 6$
find a formula for h in terms of t

[Total for Question 10 = 4 marks]

11.

The functions f and g are such that

$$f(x) = 3x - 1 \quad \text{and} \quad g(x) = x^2 + 4$$

(a) Find $f^{-1}(x)$

$$f^{-1}(x) = \dots\dots\dots (2)$$

Given that $fg(x) = 2gf(x)$,

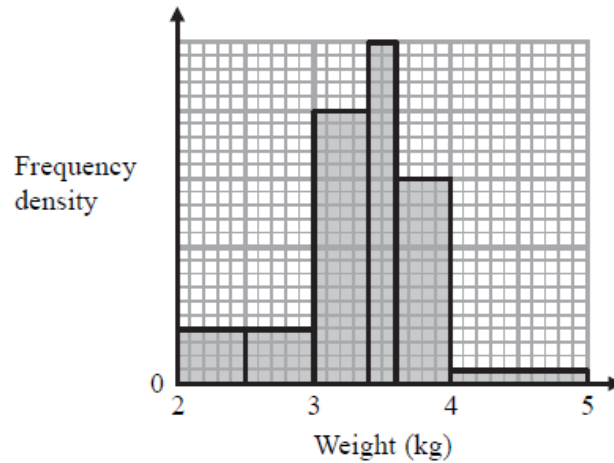
(b) show that $15x^2 - 12x - 1 = 0$

(5)

[Total for Question 11 = 7 marks]

12.

The histogram shows information about the birth weights of some babies.



6 of these babies had a birth weight less than 2.5 kg or greater than 4 kg.

Work out the number of babies who had a birth weight between 2.5 kg and 4 kg.

[Total for Question 12 = 3 marks]

13.

Jack plays a game with two fair spinners, **A** and **B**.

Spinner **A** can land on the number 2 or 3 or 5 or 7

Spinner **B** can land on the number 2 or 3 or 4 or 5 or 6

Jack spins both spinners.

He wins the game if one spinner lands on an odd number **and** the other spinner lands on an even number.

Jack plays the game twice.

Work out the probability that Jack wins the game both times.

.....

[Total for Question 13 = 4 marks]

14.

Here is triangle ABC .

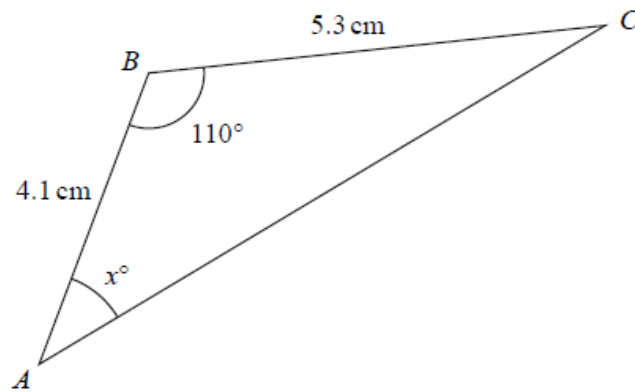


Diagram **NOT**
accurately drawn

Calculate the value of x .

Give your answer correct to 3 significant figures.

[Total for Question 14 = 5 marks]

15.

Express $\frac{4x^2 - 25}{5x^2 + 2x - 7} \times \left(\frac{2}{x-3} - \frac{3}{2x-5} \right)$ as a single fraction in its simplest form.

[Total for Question 15 = 4 marks]

16.

- (a) Express $7 - 4x - x^2$ in the form $p - (x + q)^2$ where p and q are constants.

.....
(2)

- (b) Use your answer to part (a) to solve the equation $7 - 4(y + 3) - (y + 3)^2 = 0$

Give your solutions in the form $e \pm \sqrt{f}$ where e and f are integers.

.....
(3)

The curve **C** has equation $y = 3 - 5(x + 1)^2$

The point **A** is the maximum point on **C**.

- (c) Write down the coordinates of **A**.

(.....,)
(1)

[Total for Question 16 = 6 marks]

17.

Given that $k = x - y$ and $x = \frac{1}{4y}$

express $\frac{5k}{x+2}$ in the form $\frac{a-by^2}{c+dy}$ where a, b, c and d are integers.

[Total for Question 17 = 3 marks]

18.

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

The curve **C** has equation $2x^2 + 3y^2 = 210$

Find the coordinates of the points where **L** and **C** intersect.
Show clear algebraic working.

(.....,) (.....,)

[Total for Question 18 = 5 marks]

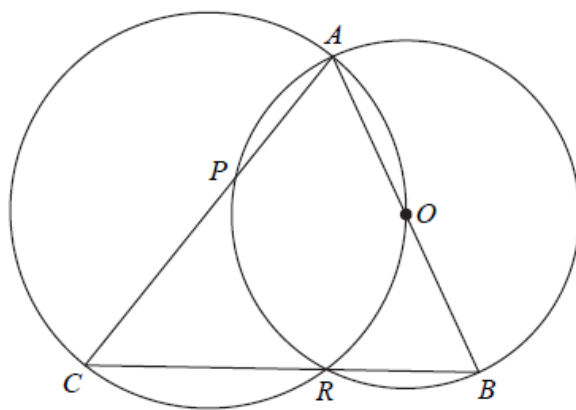
19.

Simplify $\frac{30 \times 25^{2x+7}}{\sqrt{180} \times (\sqrt{5})^{4x+9}}$

Give your answer in the form 5^w where w is an expression in terms of x
Show each stage of your working clearly.

[Total for Question 19 = 3 marks]

20.



A , B , R and P are four points on a circle with centre O .

A , O , R and C are four points on a different circle.

The two circles intersect at the points A and R .

CPA , CRB and AOB are straight lines.

Prove that $\text{angle } CAB = \text{angle } ABC$.

[Total for Question 20 = 4 marks]

21.

The total surface area of a solid hemisphere is equal to the curved surface area of a cylinder.

The radius of the hemisphere is r cm.

The radius of the cylinder is twice the radius of the hemisphere.

Given that

$$\text{volume of hemisphere} : \text{volume of cylinder} = 1 : m$$

find the value of m .

$$m =$$

[Total for Question 21 = 4 marks]

- End of Test -
