Centre name: ..... Date: .....

Candidate name: .....

AQA GCSE Mathematics (8300)

Practice Paper

Higher Tier

Time allowed: 60 minutes **Total marks:** 25

Instructions

- Answer all questions in the spaces provided.
- Show all your working. Marks may be awarded for correct working even if the answer is incorrect.
- The marks for each question are shown in brackets.

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1. **[1 mark]**

Identify which of the following is an identity.

A $2(3x-1)-3(x-2)=3x+4$ ☐

B $2(3x-1)-3(x-2)=3x-8$ ☐

C $2(3x-1)-3(x-2)=10$ ☐

D $2(3x-1)-3(x-2)=3x^2+4$ ☐

2. **[2 marks]**

Convert 29.6 kilometres into miles.

Use 5 miles $=8$ kilometres

3. **[3 marks]**

A curve has the equation $y=-2x^2+12x-5$.

Bilal attempts to find the coordinates of the turning point of this curve by completing the square.

Bilal's working is shown below:

Step 1: $y=-2(x^2-6x)-5$

Step 2: $y=-2[(x-3)^2-9]-5$

Step 3: $y=-2(x-3)^2-18-5$

Step 4: $y=-2(x-3)^2-23$

Bilal concludes that the turning point is $(3,-23)$.

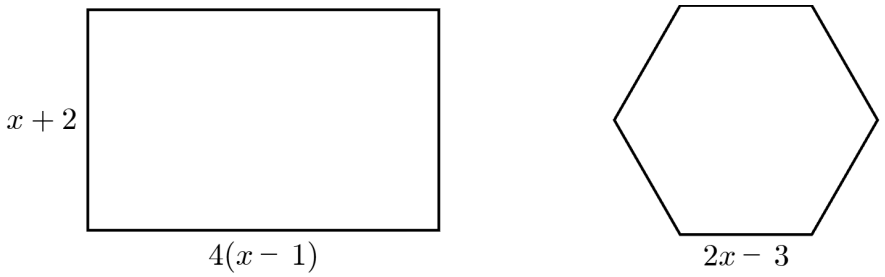
Identify the step containing Bilal's first error, explain the mistake he made, and work out the correct coordinates of the turning point.

4. **[4 marks]**

The diagram shows a rectangle and a regular hexagon.

The perimeter of the rectangle is equal to the perimeter of the regular hexagon.

Work out the value of x.



5. **[3 marks]**

A student is checking their calculation of $\frac{89.4 \times 3.12}{0.48}$ using approximation.

They write:

"Estimate: $\frac{90 \times 3}{0.5} = \frac{270}{0.5} = 135$"

"Calculator answer: 581.1"

"My estimate is 135, which is not close to 581.1. So my calculator answer must be wrong."

Identify the mathematical error in the student's work, write down the correct estimate, and evaluate their conclusion about the calculator answer.

6. **[2 marks]**

Is the inequality $-\sqrt{5} < n < -\sqrt{3}$ satisfied by exactly one integer, n?

Tick a box.

[ ] Yes

[ ] No

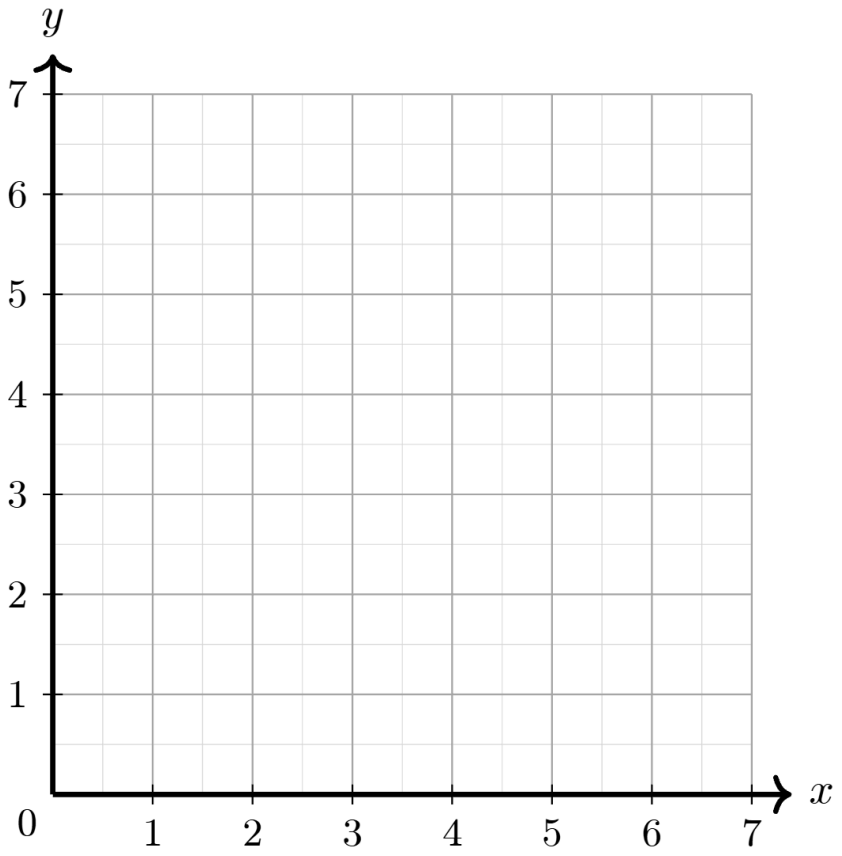
Give a reason for your answer.

7. **[3 marks]**

On the grid, identify the region represented by the following inequalities:

$y \geq 1$ x + y ≤ 6 $y > 2x - 3$

Label the region R.



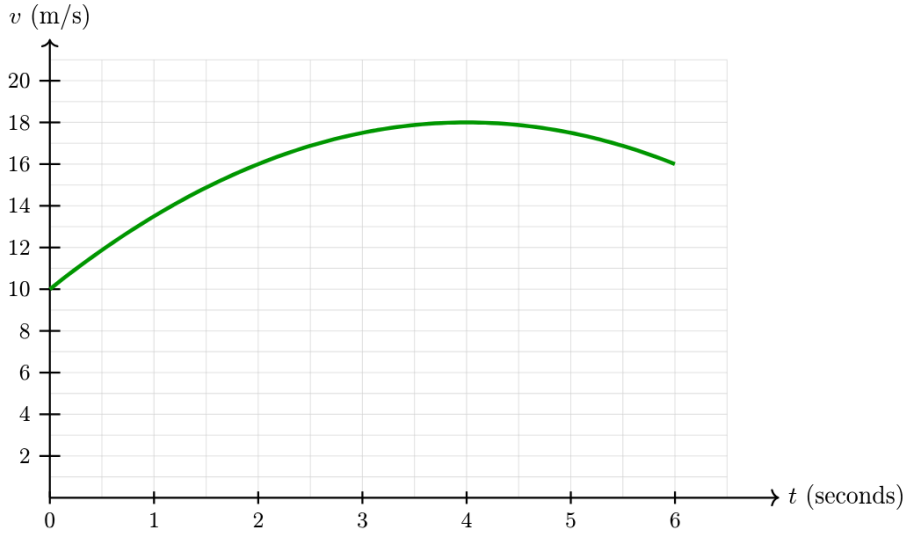
8. **[3 marks]**

A cyclist's velocity, v m/s, over a 6-second period is shown on the graph.

To achieve their target in a training session, the cyclist needs to travel a distance of more than 95 metres during these 6 seconds.

Evaluate whether the estimated distance shows that the cyclist achieved their target.

You must show your working, using three trapeziums of equal width to estimate the distance.



9. **[1 mark]**

The variables x and y are in direct proportion.

The ratio $x : y$ is equal to $5 : 8$.

Identify the correct equation connecting x and y.

A $y = 1.6x$ ☐

B $y = 0.625x$ ☐

C $5x = 8y$ ☐

D $y = x + 3$ ☐

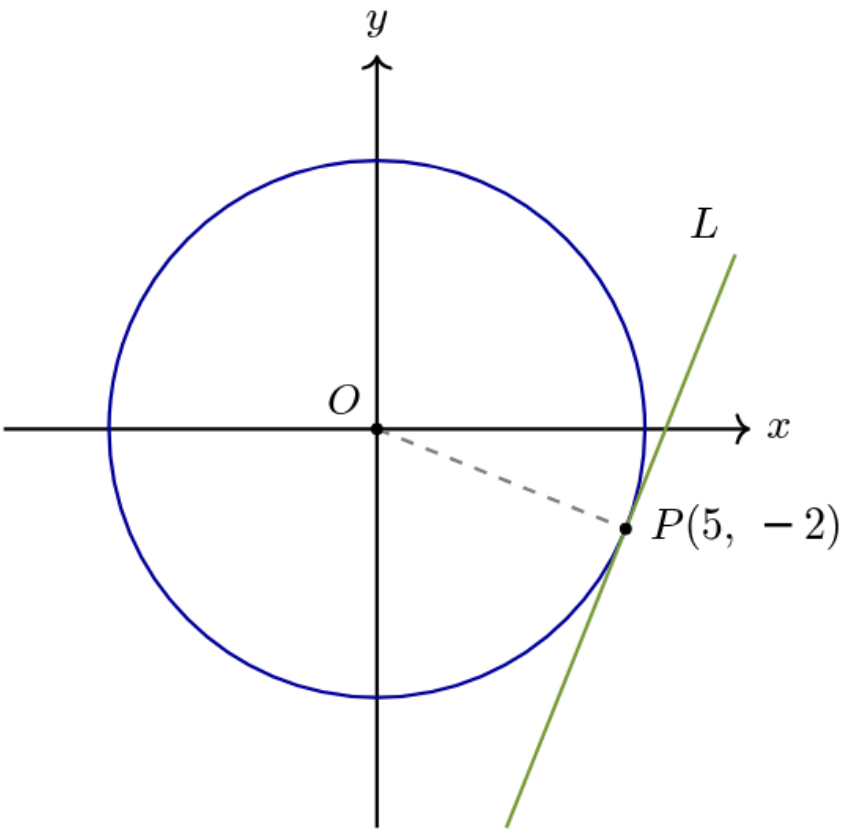
10. **[3 marks]**

The diagram shows a circle with centre at the origin O and the tangent L to the circle at the point $P(5, -2)$.

The equation of the circle is $x^2 + y^2 = 29$.

The tangent L crosses the y-axis at the point Q.

Work out the y-coordinate of Q.



END OF QUESTIONS