

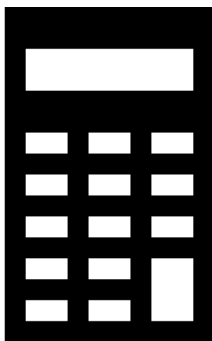
AQA, OCR, Edexcel

GCSE

GCSE Maths

Level 9 Paper (A** Paper)

Name:



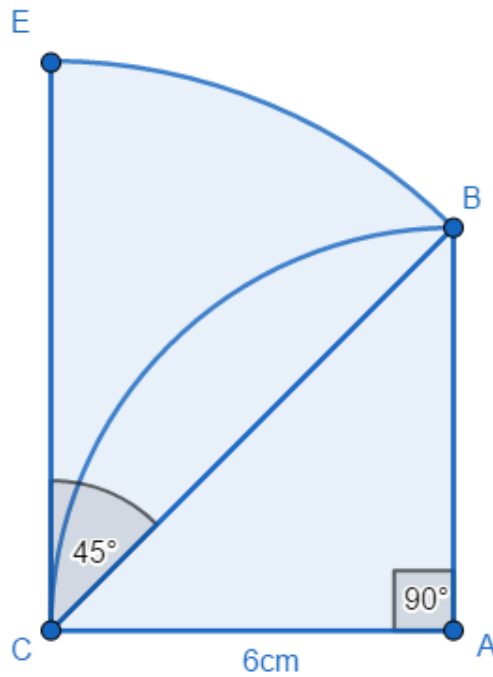
Guidance

1. Read each question carefully.
2. Don't spend too long on each question.
3. Attempt every question.
4. Always show your workings.

Revise GCSE Maths:

www.MathsMadeEasy.co.uk/gcse-maths-revision/

1. Calculate the area between the arc CB, the arc EB and the line CE. $ECA = 90^\circ$



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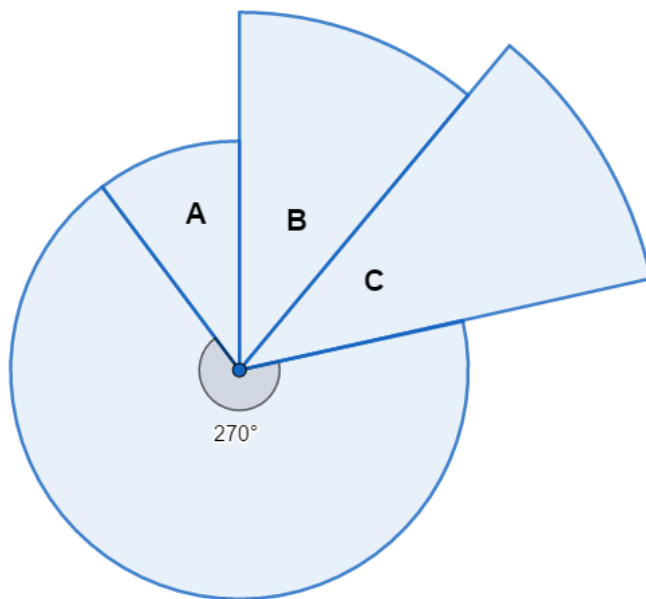
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Area =cm²
(3 marks)

2. In the diagram below the sectors A, B, and C all subtend the same angle at the centre of the circle.
The radii of the sectors A, B, and C are in the ratio 1: 2: 3.



Calculate the total area of the shape in terms of r , the radius of the circle.

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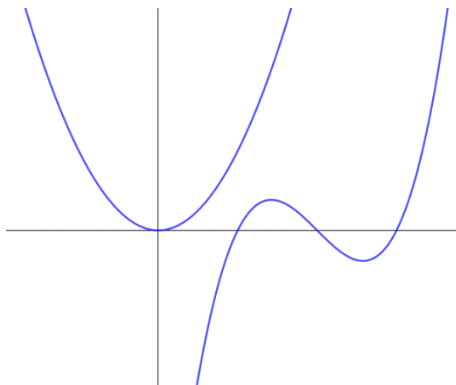
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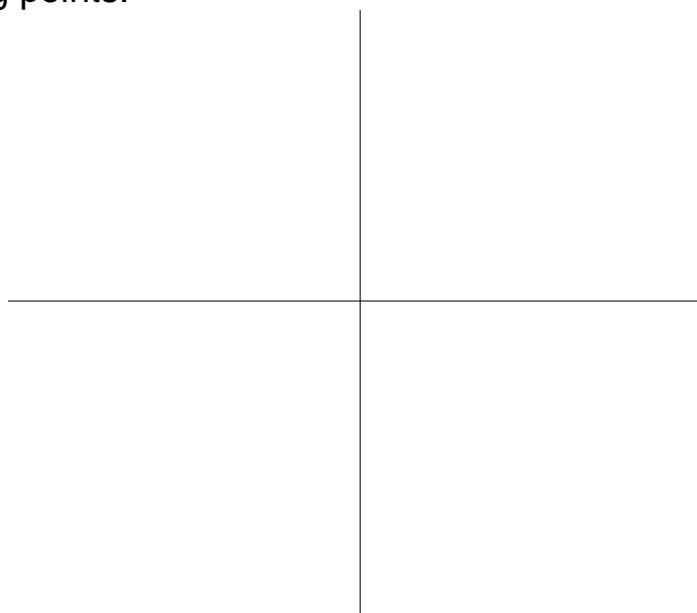
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..... (4 marks)

3. Quadratic and cubic graphs have one and two turning points respectively. This can be seen on the diagram below.



Sketch the graph of a quartic graph. A quartic graph has x^4 as the leading power of x , and three turning points.



Describe the general rule for the number of turning points of a graph with a leading power of x^n .

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4. The quadratic formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

is a re-arrangement of the general quadratic equation

$$ax^2 + bx + c = 0$$

By completing the square on the general quadratic equation, prove this result.

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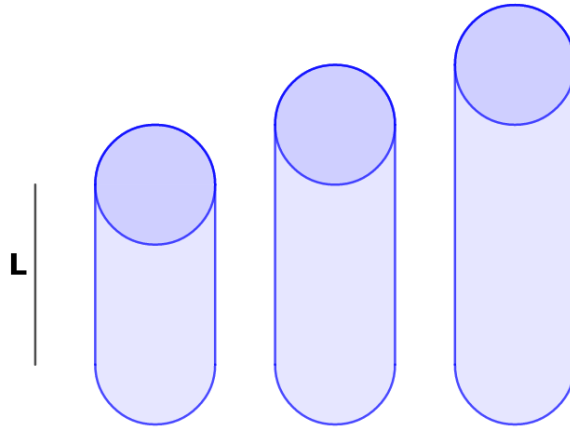
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(5 marks)

5. Three cylinders with the same radii have lengths in the ratio 3:4:5. Calculate the surface areas of the three cylinders.



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Surface area =

(4 marks)

6. The following information is known about a parallelogram ABCD.

$$A = (0,6)$$

AB has gradient 3

AD has gradient $-\frac{1}{2}$

The x-coordinate of B is 2

The y-coordinate of D is 2.

Find the co-ordinates of the point C.

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$$C = \dots\dots\dots, \dots\dots\dots$$

(4 marks)

7. a. The points $A(8,10)$ and $B(d,e)$ form a line AB. Find the equation of the line AB in terms of d and e .

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$$E: y = -3x + 6$$

b. What is a possible set of values of d and e if the line segment AB is parallel to E?

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$$d = \dots\dots\dots \quad e = \dots\dots\dots$$

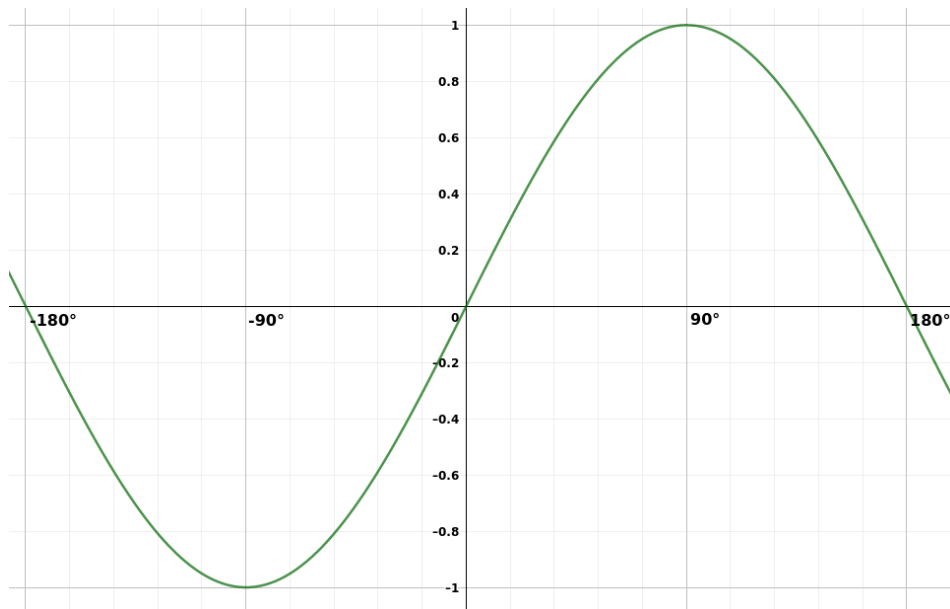
c. What is a possible set of values of d and e if the line segment AB is perpendicular to E?

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$$d = \dots\dots\dots \quad e = \dots\dots\dots$$

(2 marks, 2 marks, 3 marks)

8. The graph of $y = \sin(x)$ for $-180 \leq x \leq 180$ has been drawn on the axes below. A solution to $\sin(x) = a$ is 18° .



Find another solution, and the approximate value of a .

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The domain of $y = \sin(x)$ is no longer limited to $-180 \leq x \leq 180$.

Write down two more solutions to $\sin(x) = a$.

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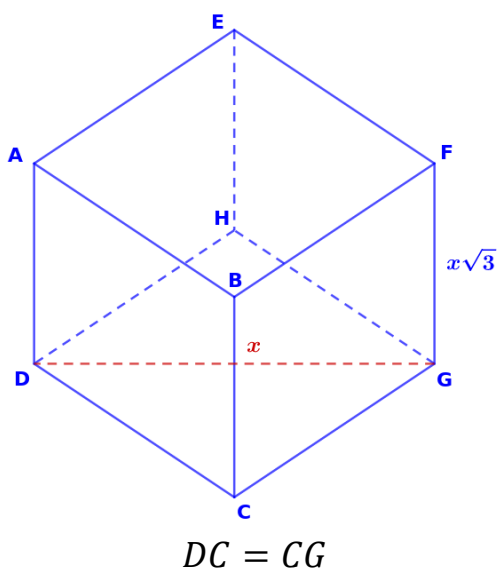
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(2 marks, 2 marks)

9. A cuboid is pictured below.



Using an algebraic argument, show that the shape is not a cube.

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Find the length CE in terms of x .

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(2 marks, 2 marks)

10. Given a frustum of height h , base radius r_1 and top radius r_2 , show that the volume of the frustum can be written as:

$$\frac{1}{3}\pi h(r_1^2 + r_2^2 + r_1r_2)$$

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(4 marks)

11. In the diagram below a hemisphere has been fixed to a cone. They have the same radius.



Given that the curved surface area of the cone is 108π , what is the surface area of the whole object in terms of s , the slanted height of the cone.

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Surface area =

(4 marks)

12. By drawing a net of a cone, prove that the surface area of a cone is given by the formula

$$\pi r s + \pi r^2$$

where r is the radius of the cone and s is the slanted height.

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(3 marks)