

Mini Test 02 - Coordinate Geometry / Graphs

Bonus fun fact question:

Given that a shape has perimeter x cm, what is the largest possible area of this shape ?

[0.5 marks]

Question 1

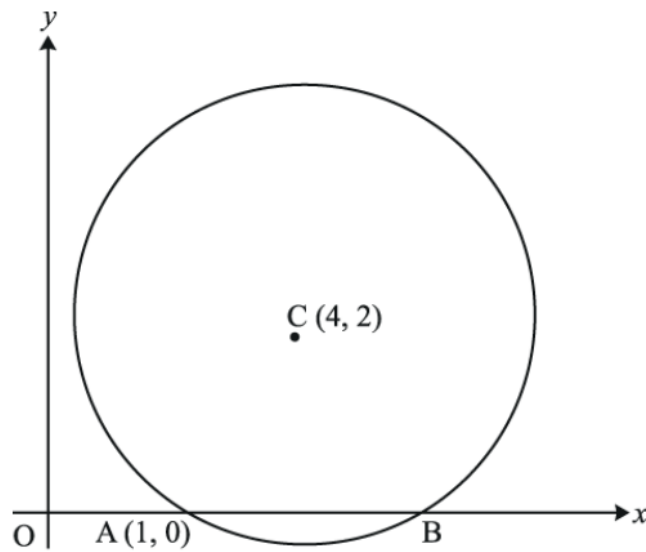


Figure 1 shows a sketch of a circle with centre at $(4, 2)$.
It intersects the x -axis at $A : (1, 0)$ and at $B : (\alpha, \beta)$.

- (a) Write down the coordinates of B . [1]
- (b) Find the equation of the circle. [3]
- (c) AD is a diameter of the circle. Find the coordinates of D . [2]
- (d) Find the equation of the tangent to the circle at D .
Give your answer in the form $y = ax + b$. [3]

Question 2

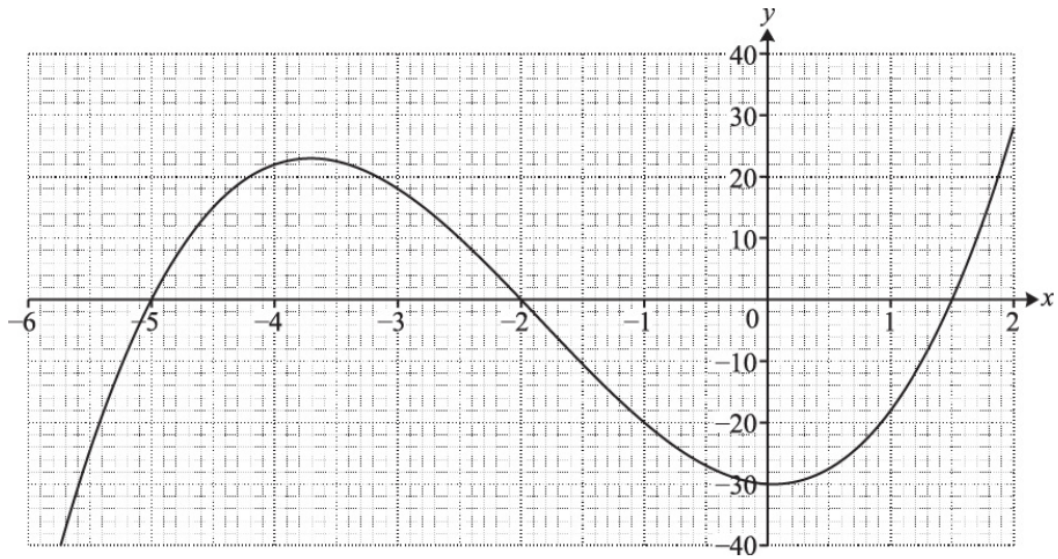


Figure 2 shows the graph of a cubic curve.
It intersects the axes at $(-5, 0)$, $(-2, 0)$, $(\frac{3}{2}, 0)$ and $(0, -30)$.

- (a) Use the intersections with both axes to express the equation of the curve in a factorised form. [2]
- (b) **Hence** show that the equation of the curve may be written as $y = 2x^3 + 11x^2 - x - 30$. [2]
- (c) Draw the line $y = 5x + 10$ accurately on the graph. Find graphically the x -coordinates of all points of intersection. [3]
- (d) By first finding and factorising a **linear** factor, show algebraically that the x -coordinates of your answer in **part (c)** can be written in the form $(x - k)(2x^2 + 7x - 20) = 0$. [3]

