

**1.** Find 
$$\frac{dy}{dx}$$
 for  $y = \frac{x^3 - x^2 - x + 1}{x^2}$  writing your answer with positive indices (2)

- 2. Find the equation of the tangent to the curve  $y = x^2 4x + 7$  at the point (3, 4) (3)
- **3.** The diagram shows the graph of The function y = f(x).

Sketch the graph of y = f'(x)



(2)

4. Find the maximum and minimum values for the function  $f(x) = 6x^2 - x^3$ in the interval  $-1 \le x \le 3$  (4)

- 5. Sketch the curve with equation  $y = x^3 3x$  annotating it fully. (8)
- 6. A gardener requires a rectangular plot of  $12m^2$  to plant some vegetables. He is planning to place some edging around the perimeter of the plot. If one side of the plot is x metres:
  - (a) Show that the perimeter in metres, P(x), can be expressed as

$$P(x) = 2x + \frac{24}{x}$$
 (2)

(b) Find the dimensions of the rectangle with the minimum perimeter. (5)