STATIONARY POINTS

1) Find the coordinates of the stationary point on the curve
$$y = x^2 + 4x + 1$$
By sketching the graph, determine whether it is a maximum or minimum.

2) Find the coordinates of the stationary point on the curve
$$y = -3x^2 + 6x - 2$$
By sketching the graph, determine whether it is a maximum or minimum.

3) Find the coordinates of the stationary point on the curve
$$y = 2x^2 - 8x + 3$$
By sketching the graph, determine whether it is a maximum or minimum.

4) Find the coordinates of the stationary point on the curve
$$y = 3x^2 + 12x + 7$$
By sketching the graph, determine whether it is a maximum or minimum.

5) Find the coordinates of the stationary point on the curve with equation
$$y = 4x^2 + \frac{1}{x}$$

6) Find the coordinates of the stationary points on the curve
$$y = x^3 - 3x^2 - 9x$$

7) Find the coordinates of the stationary points on the curve
$$y = 2x^3 + x^2 - 4x$$

8) A rectangle has side lengths x and $10 - x$. Work out the value of x that maximises the area.

9) The surface area of a cuboid is $A = 4x(10 - x)$. Find the value of x that maximises the surface area.

10) The area of a rectangle is given by
$$A = (x + 1)(8 - x)$$
Work out the maximum area of the rectangle.

11) The volume of a box is given by
$$V = x(6 - x)^2$$
Work out the value of x that maximises the volume.
Then, work out the maximum volume.

12) The area of a rectangle is given by
$$A = (3x - 2)(8 - x)$$
Find the maximum area.

13) A curve has equation $y = x^2 + ax + 5$. The stationary point of the curve lies on the line $y = 1$. Find the value of a.