



1. Find  $\frac{d^2y}{dx^2}$  when  $y = x^3 - 6x^2 - 36x + 15$

(2)

2. Find the stationary points of  $y = \frac{x^4+16}{2x^2}$  and state if it is a maximum or minimum.

(6)

### Solutions

1a.

$\frac{dy}{dx} = 3x^2 - 12x - 36$	<b>M1</b>
$\frac{d^2y}{dx^2} = 6x - 12$	<b>M1</b>

1b.

$y = \frac{1}{2}x^2 + 8x^{-2}$	<b>M1</b>
$\frac{dy}{dx} = x - 16x^{-3}$ At stationary point, $\frac{dy}{dx} = 0$	<b>M1</b>
$x - 16x^{-3} = 0$ $x^4 = 16$ $x = \pm 2$	<b>M1</b>
$\frac{d^2y}{dx^2} = 1 + 48x^{-4}$	<b>M1</b>
At $(-2, 4)$ , $\frac{d^2y}{dx^2} = 1 + 48(-2)^{-4} = 4$ Therefore, minimum point	<b>M1</b>
At $(2, 4)$ , $\frac{d^2y}{dx^2} = 1 + 48(2)^{-4} = 4$ Therefore, minimum point	<b>M1</b>

