

10. Given that  $y = x^4 - x^3 + 4x - 1$ , find  $\frac{d^2y}{dx^2}$  and hence find the values of  $x$  for which  $\frac{d^2y}{dx^2} = 0$ .

$\frac{dy}{dx} = ?$	$\frac{dy}{dx} = 4x^3 - 3x^2 + 4$
$\frac{d^2y}{dx^2} = ?$	$\frac{d^2y}{dx^2} = 12x^2 - 6x$
$\frac{d^2y}{dx^2} = 0$	$\Rightarrow 12x^2 - 6x = 0$
$\div 6$	$2x^2 - x = 0$
HCF	$x(2x - 1) = 0$
	$x = 0 \quad \left  \quad \begin{array}{l} 2x - 1 = 0 \\ 2x = 1 \\ x = 1/2 \end{array} \right.$

12. Given that  $f(x) = \frac{2}{x} + 4\sqrt{x}$ , show that  $f''(4) = -\frac{1}{16}$ .

Write in indices form	$f(x) = 2x^{-1} + 4x^{1/2}$
1st derivative	$f'(x) = -2x^{-2} + 2x^{-1/2}$
2nd derivative	$f''(x) = 4x^{-3} - 1x^{-3/2}$
$f''(4) = ?$	$f''(4) = 4(4)^{-3} - 1(4)^{-3/2}$ $= -\frac{1}{16}$