22nd October

Corbettmaths

Expand and simplify fully $(5y-1)^2(y-2)$	$= (25y^2 - 10y + 1)(y-2)$ $= \underline{25y^3 - 60y^2 + 21y - 2}$
Find where the matrix $\begin{pmatrix} 5 & 0 \\ 2 & -4 \end{pmatrix}$ maps the point $(3, -2)$	$\begin{pmatrix} 5 & 0 \\ 2 & -4 \end{pmatrix}\begin{pmatrix} 3 \\ -2 \end{pmatrix} = \begin{pmatrix} 15 \\ 14 \end{pmatrix}$ $(3,-2) \rightarrow \underline{(15, 14)}$
$y = 2x^8 + \frac{5}{x^3}$ Work out $\frac{d^2y}{dx^2}$	$= 2x^8 + 5x^{-3}$ $\frac{dy}{dx} = 16x^7 - 15x^{-4}$ $\frac{d^2y}{dx^2} = 112x^6 + 60x^{-5}$ $= \underline{112x^6 + \frac{60}{x^5}}$
Show that $2cos^2\theta \equiv 2 - 2sin^2\theta$	$\cos^2\theta + \sin^2\theta = 1$ $\Rightarrow \cos^2\theta = 1 - \sin^2\theta$ $\Rightarrow \underline{2\cos^2\theta = 2 - 2\sin^2\theta}$
Hence solve $2cos^2\theta - sin\theta = 1$ for $0^\circ \leq \theta \leq 360^\circ$	$2 - 2\sin^2\theta - \sin\theta = 1$ $0 = 2\sin^2\theta + \sin\theta - 1$ $0 = (2\sin\theta - 1)(\sin\theta + 1)$ $\sin\theta = \frac{1}{2}, -1$ $\underline{\theta = 30^\circ, 150^\circ, 270^\circ}$