


6th March	
<p>Simplify</p> $\frac{x-1}{x+1} + \frac{x+4}{x^4} \div \frac{4x+16}{x}$ $\frac{\cancel{x+4}}{x^4} \times \frac{\cancel{x}}{4(x+4)} = \frac{1}{4x^3}$	 Corbettmaths $\frac{x-1}{x+1} + \frac{1}{4x^3}$ $\frac{4x^3(x-1) + x+1}{4x^3(x+1)} = \frac{4x^4 - 4x^3 + x + 1}{4x^3(x+1)}$
<p>Use Pascal's Triangle to work out the coefficient of <math>x^3</math> in the expansion of <math>(1 + 3x)^4</math></p> $\begin{array}{ccccccc} & & & & 1 & & & & \\ & & & & 1 & & 1 & & \\ & & & 1 & 2 & & 1 & & \\ & & 1 & 3 & 3 & & 1 & & \\ 1 & 4 & 6 & 4 & 1 & & & & \end{array}$ <p><math>4 \times 1 \times (3x)^3</math>  <math>108x^3</math>  <u>108</u></p>	
<p><math>y = 2x^4 - \frac{1}{x}</math></p> <p>Work out the value of <math>\frac{d^2y}{dx^2}</math> when <math>x = -2</math></p> $y = 2x^4 - x^{-1} \quad \frac{dy}{dx} = 8x^3 + x^{-2}$	$\frac{d^2y}{dx^2} = 24x^2 - 2x^{-3}$ $= 24x^2 - \frac{2}{x^3}$ <p>when <math>x = -2</math> <math>\frac{d^2y}{dx^2} = 96.25</math></p>
<p><math>f(x) = \sqrt{x^2 + 8x - c}</math></p> <p>with domain all values of <math>x</math>.</p> <p>Work out the possible values of <math>c</math>.</p> $x^2 + 8x - c \geq 0$ $(x+4)^2 - 16 - c \geq 0$	<p>Coordinates of min point  <math>(-4, -16 - c)</math></p> <p><math>\therefore -16 - c \geq 0</math>  <math>c \leq -16</math></p>