


12th June	
<p>Simplify</p> $\frac{x-2}{x+1} + \frac{x+3}{x^4} \div \frac{2x+6}{x^3}$	<div style="text-align: right;"> Corbettmaths</div> $\frac{x+3}{x^4} \times \frac{x^3}{2(x+3)} = \frac{1}{2x}$ $\frac{x-2}{x+1} + \frac{1}{2x} = \frac{2x(x-2)+x+1}{2x(x+1)}$ $= \frac{2x^2-3x+1}{2x(x+1)} = \frac{(2x-1)(x-1)}{2x(x+1)}$
<p>The nth term of a sequence is</p> $n^2 - 2n + 11 = t(n)$ <p>The difference between two consecutive terms is 21.</p> <p>Work out the two terms</p>	$t(n+1) - t(n)$ $= (n+1)^2 - 2(n+1) + 11 - n^2 + 2n - 11$ $= n^2 + 2n + 1 - 2n - 2 + 11 - n^2 + 2n - 11$ $= 2n - 1 = 21$ $\Rightarrow n = 11$ $t(11) = 110, \quad t(12) = 131$
<p>Find the set of values of x for which</p> $f(x) = 300x - 4x^3$ <p>is an increasing function</p>	$f'(x) = 300 - 12x^2$ <p>Increasing <math>\Rightarrow 300 - 12x^2 &gt; 0</math></p> $12x^2 < 300$ $x^2 < 25$ $\underline{-5 < x < 5}$
<p>Solve</p> $3 \tan x = 4 \sin x$ <p>for <math>0^\circ &lt; x &lt; 360^\circ</math></p>	$\frac{3 \sin x}{\cos x} = 4 \sin x$ $3 \sin x = 4 \sin x \cos x$ $0 = 4 \sin x \cos x - 3 \sin x$ $0 = \sin x (4 \cos x - 3)$ $\sin x = 0, \quad \cos x = \frac{3}{4}$ $\underline{x = 180^\circ, 41.4^\circ, 318.6^\circ}$