



Air maths tuition

Interact, engage and perform

Binomial Expansion | Past Paper Question | C4 Edexcel June 2010 Q5(b)

$$(1+a)^n \equiv 1 + na + \frac{n(n-1)}{2!}a^2 + \frac{n(n-1)(n-2)}{3!}a^3 + \dots$$

$\begin{aligned} \frac{2x^2 + 5x - 10}{(x-1)(x+2)} &\equiv 2 - \frac{1}{x-1} + \frac{4}{x+2} \\ &\equiv 2 - (x-1)^{-1} + 4(x+2)^{-1} \\ &\equiv 2 + (1-x)^{-1} + 2\left(1 + \frac{x}{2}\right)^{-1} \\ &\equiv 2 + \left[1 + (-1)(-x) + \frac{(-1)(-2)}{2!}(-x)^2 + \dots\right] \\ &\quad + 2\left[1 + (-1)\left(\frac{x}{2}\right) + \frac{(-1)(-2)}{2!}\left(\frac{x}{2}\right)^2 + \dots\right] \\ &\equiv 2 + 1 + x + x^2 + 2 - x + \frac{x^2}{2} + \dots \\ &\equiv 5 + \frac{3x^2}{2} + \dots \end{aligned}$	$\begin{aligned} (x-1)^{-1} &\equiv [-1(1-x)]^{-1} \\ &\equiv (-1)^{-1}(1-x)^{-1} \\ &\equiv \frac{1}{-1}(1-x)^{-1} \\ &\equiv -(1-x)^{-1} \\ (x+2)^{-1} &\equiv \left[2\left(1 + \frac{x}{2}\right)\right]^{-1} \\ &\equiv 2^{-1}\left(1 + \frac{x}{2}\right)^{-1} \\ &\equiv \frac{1}{2}\left(1 + \frac{x}{2}\right)^{-1} \end{aligned}$
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