4A (1+x)n

How do we Calculate nCr?

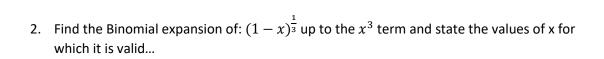
$$(1+x)^n = 1 + nx + \frac{n(n-1)}{1\times 2}x^2 + \dots + \frac{n(n-1)\dots(n-r+1)}{1\times 2\times \dots \times r}x^r + \dots \quad (|x|<1, n\in\mathbb{R})$$

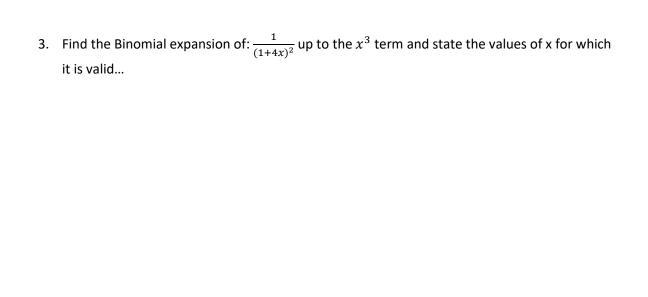
1. Find: $(1+x)^4$ without using the nCr button on your calculator

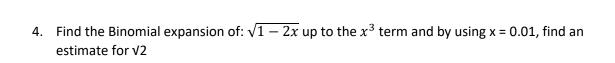
2. Find: $(1-2x)^3$ without using the nCr button on your calculator

When does this formula come unstuck?

1. Find
$$\frac{1}{(1+x)}$$
 up to the x^3 term







$$f(x) = \frac{2+x}{\sqrt{1+5x}}$$

a) Find the x^2 term in the series expansion of f(x)

b) State the range of values of x for which the expansion is valid

- 6. In the expansion of $(1 + kx)^{-4}$ the coefficient of x^2 is 90, and k > 0
- a) Find the value of \boldsymbol{k}

b) Find the corresponding coefficient of the x^3 term