C1 Jan 2009

using pascals triangle to establish co-efficients

1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
1 5 10 10 5 1

$(a+b)^5 = a^5 + 5a^4b + 10a^3b^2 + 10a^2b^3 + 5ab^4 + b^5$

b) with $a = \frac{1}{4}$ and $b = 2x$

$\left(\frac{1}{4} + 2x\right)^5 = \left(\frac{1}{4}\right)^5 + 5\left(\frac{1}{4}\right)^4(2x) + 10\left(\frac{1}{4}\right)^3(2x)^2 + \left(10\left(\frac{1}{4}\right)^2(2x)^3\right) + \text{therest}$

This is the only thing that is required.

Term containing x^3 is $10\left(\frac{1}{4}\right)^2(2x)^3$

$= 10\left(\frac{1}{16}\right)(8x^3)$

$= \frac{10}{2}x^3$

$= 5x^3$

So the co-efficient of x^3 is 5