Expand and Simplify Binomials

A Level Further A

Pre-Uni Maths for Sciences 3.3.1

Part A $(x+1)^4$

Expand and simplify $(x+1)^4$.

The following symbols may be useful: x

Part B $(z+2a)^3$

Expand and simplify $(z+2a)^3$.

The following symbols may be useful: a, z

Part C $(a-b)^5$

Expand and simplify $(a-b)^5$.

The following symbols may be useful: a, b

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Binomial Expansion 3

Pre-Uni Maths for Sciences 3.3.6

A Level C C C Further A P P P

Expand $(3-a)^4$ in ascending powers of a up to and including the term in a^3. Hence, without using a calculator, evaluate $(2.9)^4$ correct to 2 decimal places

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Gameboard:
STEM SMART Single Maths 27 - Binomial Expansion - Natural n

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Binomial Expansion 5

A Level

Use binomial expansion to expand and simplify the expression $\left(ax^2 + \frac{2}{x}\right)^5$.

The following symbols may be useful: x

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Physics. You work it out.

Find Coefficients 1

A Level Further A

Pre-Uni Maths for Sciences 3.3.2

Find the coefficient of x^3 in the expansion of:

Part A $(x-10)^5$

$(x-10)^5$

Part B $(2x-\frac{1}{2})^6$

$\left(2x-\frac{1}{2}\right)^6$

Part C $(x-y)^{10}$

$(x-y)^{10}$

The following symbols may be useful: `x, y`

Part D $(x - \frac{1}{x})^7$

$$\left(x - \frac{1}{x}\right)^7$$

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Find Coefficients 2

Pre-Uni Maths for Sciences 3.3.3

A Level Further A

Without expanding the binomials, find:

Part A Coefficient of x^4y^6

The coefficient of x^4y^6 in the expansion of $(x^2 + 3y^2)^5$.

Part B Coefficient of x^{20}

The coefficient of x^{20} in the expansion of $(x^2 + 3x)^{12}$.

Part C The coefficient of ab^7

The coefficient of ab^7 in the expansion of $(a + \frac{1}{4}b)^8$.

Part D Constant term

The constant term in the expansion of $\left(\frac{x^2}{2} - \frac{8}{x}\right)^9$.

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Group and Expand

A Level Further A

Pre-Uni Maths for Sciences 3.3.8

Expand $(1 - 2x + 3x^2)^7$ in ascending powers of x as far as x^3.

The following symbols may be useful: x

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Binomial Theorem Applied to Variable Acceleration

A Level

The force $F(t)\,\mathrm{N}$ on a particle of mass $4\,\mathrm{kg}$ at time $t\,\mathrm{s}$ is given by

$$F(t) = (\sqrt{t}+2)^5 - (\sqrt{t}-2)^5$$

for $t \geq 0$.

At $t = 0$ the particle is at rest at the origin. Find an expression for its displacement from the origin, $x\,\mathrm{m}$, in terms of t.

The following symbols may be useful: `t, x`

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