

A2.A.36: Binomial Expansions 7: Apply the binomial theorem to expand a binomial and determine a specific term of a binomial expansion

- 1 What is the fourth term in the expansion of $(2x - y)^5$?

- 2 What is the third term in the expansion of $(x + 1)^5$?

- 3 Find, in simplest form, the middle term in the expansion of $\left(x^2 + \frac{1}{x}\right)^6$.

- 4 Expand and express in simplest form: $\left(x - \frac{1}{x}\right)^4$.

- 5 Write the binomial expansion of $(2x - 1)^5$ as a polynomial in simplest form.

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Answer Section

1 ANS:

$$-40x^2y^3. {}_5C_3(2x)^{5-3}(-y)^3 = 10(4x^2)(-y^3) = -40x^2y^3$$

REF: 010726b

2 ANS:

$$10x^3$$

REF: 069515siii

3 ANS:

$$20x^3$$

REF: 019941siii

4 ANS:

$$x^4 - 4x^2 + 6 - \frac{4}{x^2} + \frac{1}{x^4}$$

REF: 069641siii

5 ANS:

$$32x^5 - 80x^4 + 80x^3 - 40x^2 + 10x - 1. {}_5C_0(2x)^5(-1)^0 = 32x^5. {}_5C_1(2x)^4(-1)^1 = -80x^4. {}_5C_2(2x)^3(-1)^2 = 80x^3. {}_5C_3(2x)^2(-1)^3 = -40x^2. {}_5C_4(2x)^1(-1)^4 = 10x. {}_5C_5(2x)^0(-1)^5 = -1$$

REF: 011136a2