

Finding Coefficients in Expansions

(a) Find the coefficient of the x^2 term in the expansion of $(2 + x)^3$

$$(a) {}_3C_2 \times 2 \times 1 = 6$$

(b) Find the coefficient of the x^3 term in the expansion of $(1 + 2x)^4$

$$(b) {}_4C_3 \times 1 \times 8 = 32$$

(c) Find the coefficient of the x term in the expansion of $(2 + 3x)^5$

$$(c) {}_5C_1 \times 2^4 \times 3 = 240$$

(d) Find the coefficient of the x^2 term in the expansion of $(1 - 3x)^6$

$$(d) {}_6C_2 \times 1 \times (-3)^2 = 135$$

(a) Find the coefficient of the x term in the expansion of $(4 - 3x)^5$

$$(a) {}_5C_1 \times 4^4 \times -3 = -3840$$

(b) Find the coefficient of the x^2 term in the expansion of $(x + 5)^6$

$$(b) {}_6C_2 \times 1^2 \times 5^4 = 9375$$

(c) Find the coefficient of the x^3 term in the expansion of $(2x - 1)^4$

$$(c) {}_4C_3 \times 2^3 \times (-1) = -32$$

(d) Find the coefficient of the x^2 term in the expansion of $(\sqrt{2} + x)^5$

$$(d) {}_5C_2 \times (\sqrt{2})^3 \times 1^2 = 20\sqrt{2}$$

(a) The coefficient of the x^5 term in the expansion of $(a + x)^7$ is 84. Given that a is positive, find its value.

$$(a) {}_7C_5 \times a^2 \times 1 = 84$$
$$a = 2$$

(b) The coefficient of the x^3 term in the expansion of $(3 - bx)^5$ is -2430 . Find the value of b .

$$(b) {}_5C_3 \times (-b)^3 \times 3^2 = -2430$$
$$b = 3$$

(a) In the expansion of $(2 + ax)^4$ the coefficient of the x^2 term is three times the coefficient of the x term. Find the value of a .

$$(a) 32a \times 3 = 24a^2$$
$$a = 4$$

(b) In the expansion of $(\frac{x}{2} + b)^5$ the coefficient of the x^2 term is 72 times the coefficient of the x^4 term. Find the two possible values of b .

$$(b) \frac{5}{16}b \times 72 = \frac{10}{4}b^3$$
$$b = \pm 3$$