Tarefa Básica

① $(1+2x^2)^6$

$$\binom{6}{K} \cdot 1^{6-K} \cdot 2x^2 = \boxed{}\, x^8$$

$2K = 8$

$K = 4$

$$\binom{6}{K} \cdot 1 \cdot 2^K \cdot (x^2)^K = \boxed{}\, x^8$$

$$\binom{6}{4} \cdot 2^4 \cdot x^8 = 15 \cdot 16 \cdot x^8 = 240x^8$$

$$\frac{6.5.\cancel{4}.\cancel{3}}{\cancel{4}.\cancel{3}.2.1} = 15$$

Alternativa C

② $(14x - 13y)^{237}$

Alternativa Ⓑ

$(14 - 13)^{237} = 1^{237} = 1$

③ $(x + a)^{11}$

$\binom{11}{K} x^{11-K} \cdot a^{K} = 1386x^{5}$

$11 - K = 5$

$K = 6$

$\binom{11}{6} x^{5} \cdot a^{6} = 1386x^{5}$

$462x^{5} \cdot a^{6} = 1386x^{5}$

$\frac{11 \cdot 10 \cdot 9 \cdot 8 \cdot 7 \cdot \cancel{6}}{\cancel{6} \cdot 4 \cdot 5 \cdot 3 \cdot 2 \cdot 1} = 462$

$a^{6} = \frac{1386\cancel{x^{5}}}{462\cancel{x^{5}}}$

$a^{6} = 3$

$a = \sqrt[6]{3}$

Alternativa Ⓐ

④ $\left(x + \frac{1}{x^{2}}\right)^{9} = (x + x^{-2})^{9}$

$\binom{9}{K} x^{9-K} \cdot x^{-2K} = x^{0}$

$\binom{9}{3} x^{6} \cdot x^{-6}$

$9 - K - 2K = 0$

$3K = 9$

$K = 3$

Alternativa Ⓓ

⑤ $\left(x + \frac{1}{x^{2}}\right)^{n} = (x + x^{-2})^{n}$

$\binom{n}{K} x^{n-K} \cdot x^{-2K} = x^{0}$

$n - K - 2K = 0$

$-3K = -n$

$K = \frac{n}{3}$

Alternativa Ⓒ

⑥ $K = \left(3x^3 + \frac{2}{x^2}\right)^5 - \left(243x^{15} + 810x^{10} + 1080x^5 + \frac{240}{x^5} + \frac{32}{x^{10}}\right)$

$(3x^3 + 2x^{-2})^5$

$1(3x^3)^5(2x^{-2})^0 + 5(3x^3)^4(2x^{-2})^1 + 10(3x^3)^3(2x^{-2})^2 + 10(3x^3)^2(2x^{-2})^3 + 5(3x^3)^1(2x^{-2})^4 + 1(3x^3)^0(2x^{-2})^5$

$243^{15} + 405^{12} . 2x^{-2} + 270x^9 . 4x^{-4} + 90x^6 . 8x^{-6} + 15x^3 . 16x^{-8} + 32x^{-10}$

$\cancel{243^{15}} + \cancel{810^{10}} + \cancel{1080x^5} + 720 + \cancel{\frac{240}{x^5}} + \cancel{\frac{32}{x^{10}}}$

$K = 720$ Alternativa (E)

⑦ $(2x + y)^5$ Alternativa (C)

$(2 + 1)^5 = 3^5 = 243$