TAREFA BÁSICA - TEOREMA DO BINÔMIO

① $(1+2x^2)^6$

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

$6-k+2k=2$

$k=6-2$

$k=4$

$$\binom{6}{4} \cdot 1^{6-4} \cdot (2x^2)^4$$

$15 \cdot 1^2 \cdot 2^4 x^8$

$15 \cdot 16x^8$

$240x^8$

ALTERNATIVA (C)

② $(14x-13y)^{237}$

$\downarrow \quad \downarrow$

$14+(-13)$

$14-13$

1 ALTERNATIVA (B)

③ $(x+a)^{11}$

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

$\binom{9}{k} x^{9-k} + x^{-2k}$ $\binom{9}{3}$ ALTERNATIVA (D)

$9-k-2k=0$

$-3k=-9$

$k=\frac{-9}{-3}=3$

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

$\binom{n}{k} x^{n-k} + x^{-2k}$

SE $N=8$

$\rightarrow \binom{8}{k} x^{8-k} + x^{-2k}$

$8-k-2k=0$

$-3k=-8$

$k=\frac{-8}{-3}=2{,}6 \rightarrow$ FALHA

SE $N=12$

$\binom{12}{k} = x^{12-k} \; x^{-2k}$

$-12-k-2k=0$

$-3k=-12$

$k=\frac{-12}{-3}=4 \rightarrow$ SUCESSO

CASO N, SEJA UM NÚMERO MULTIPLO DE 3 HAVERA UM TERMO INDEPENDENTE DE X

ALTERNATIVA (C)

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

SE $x = 1$ $\qquad x \in \mathbb{R}$ e $x > 0$

$\left(3 \cdot 1^3 + \frac{2}{1^2}\right)^5 - \left(243 \cdot 1^{15} + 810 \cdot 1^{10} + 1080 \cdot 1^5 + \frac{240}{1^5} + \frac{32}{1^{10}}\right)$

$\Downarrow$

$(3+2)^5 - (243 + 810 + 1080 + 240 + 32)$

$\Downarrow$

$5^5 - 2405$

$\Downarrow$

$3125 - 2405$

$\Downarrow$

$K = 720$ ALTERNATIVA (E)

⑦ $(2x+y)^5 = 32x^5 + 80x^4y + 80x^3y^2 + 40x^2y^3 + 10xy^4 + y^5$

$\Downarrow$

$32 + 80 + 80 + 40 + 10 + 1$

$\Downarrow$

243 ALTERNATIVA (C)