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1. $(1+2x^2)^6$ $\binom{6}{k} 1^{6-k}.(2x^2)^k = ?x^8 \Rightarrow 2k=8$

$k=4$

Termo geral

$\binom{6}{0}1^6.(2x^2)^0 + \binom{6}{1}1^5.(2x^2)^1 \ldots \binom{6}{4}1^2.(2x^2)^4 \ldots \binom{6}{6}1^0.(2x^2)^6$

$\downarrow$

$\frac{6!}{4!2!}.1.16x^8$

$\frac{6.5.4!}{4!.2}.16x^8$

$15.16x^8$

$240x^8$

$\downarrow$

coeficiente

Letra C.

2. $(14x-13y)^{237}$

soma dos coeficientes

$x=1$ $(14.1-13.1)^{237}$

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

$1^{237} \rightarrow 1$

Letra B

3. $(x+a)^{11}$ $\binom{11}{k} x^{11-k} \cdot a^k = ? x^5 \rightarrow 11-k=5$

$k=6$

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

$\frac{11 \cdot 10 \cdot 9 \cdot 8 \cdot 7 \cdot 6!}{6! \cdot 5!} a^6 = 1386$

$\frac{55440}{120} a^6 = 1386$

$462 a^6 = 1386$

$a^6 = \frac{1386}{462}$

$a^6 = 3$

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

Letra A.

4. $\left(x + \frac{1}{x^2}\right)^9$ $\binom{9}{k} x^{9-k} \cdot \left(x^{-2}\right)^k \rightarrow 9-k-2k=0$

$-3k = -9$

$K=3 \rightarrow \binom{9}{K=3}$

Letra D.

5. $\left(x + \frac{1}{x^2}\right)^n \quad \binom{n}{K} x^{n-K} \cdot x^{-2K} \rightarrow n - K - 2K = 0$

$n - 3K = 0$

$n = 3K$

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

Letra C.

6. $\left(3x^3 + \frac{2}{x^2}\right)^5 = \left(243x^{15} + 810x^{10} + 1.080x^5 + \frac{240}{x^5} + \frac{32}{x^{10}}\right)$

$\binom{5}{0}(3x^3)^5 + \binom{5}{1}(3x^3)^4 \cdot \frac{2}{x^2} + \binom{5}{2}(3x^3)^3 \cdot \left(\frac{2}{x^2}\right)^2 + \binom{5}{3}(3x^3)^2 \cdot \left(\frac{2}{x^2}\right)^3 + \binom{5}{4}(3x^3)^1 \cdot \left(\frac{2}{x^2}\right)^4 + \binom{5}{5}\left(\frac{2}{x^2}\right)^5$

$243x^{15} + 810x^{10} + 1.080x^5 + \frac{240}{x^5} + \frac{32}{x^{10}}$

$K = 720$

Letra E.

7. $(2x + y)^5$

Soma dos coeficientes:

$x = 1$ $\quad (2 \cdot 1 + 1)^5$

$y = 1$ $\quad (1 + 1)^5$

$3^5 \rightarrow 243$

Letra C.