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Tarefa Básica

1. $(1+2x^2)^6$

$\binom{6}{k} 1^{6-k} \cdot (2x^2)^k = \boxed{?} x^8$ | $2k = 8 \rightarrow k = 4$

$\binom{6}{4} 1^2 \cdot 16x^8 \rightarrow \frac{6.5.4!}{2!4!} \cdot 1 \cdot 16x^8 \rightarrow \frac{30}{2} \cdot 16x^8 \rightarrow \boxed{240} x^8$

Alternativa C

2. $(14x-13y)^{237} \rightarrow (14.1-13.1)^{237} \rightarrow (1)^{237} = \boxed{1}$

Alternativa B

3. $(x+a)^{11} = 1386x^5$

$\binom{11}{k} x^{11-k} \cdot a^k$ $11-k=5 \rightarrow k=6$

$\binom{11}{6} \cancel{x^5} \cdot a^6 = 1386\cancel{x^5} \rightarrow \frac{11!}{6!5!} \cdot a^6 = 1386$

$\frac{11.10.9.8.7.\cancel{6!}}{\cancel{6!}.5.4.3.2.1} \cdot a^6 = 1386 \rightarrow 462a^6 = 1386$

$a^6 = \frac{1386}{462} \rightarrow a^6 = 3 \rightarrow \boxed{a = \sqrt[6]{3}}$

Alternativa A

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

$\binom{9}{k} x^{9-k} \cdot (x^{-2})^k = \boxed{?}\, x^0 \qquad 9-k-2k=0 \rightarrow (-3k)=(-9)$

$k = 3$

$\boxed{\text{Alternativa D}}$

$\binom{9}{3} \cancel{x^6} \cdot \cancel{x^{-6}} \rightarrow \boxed{\binom{9}{3}} \rightarrow$ termo independente

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

$\binom{n}{k} x^{n-k} \cdot (x^{-2})^k = \boxed{?}\, x^0 \qquad n-k-2k=0 \rightarrow (-3k)=(-n)$

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

$\binom{n}{\frac{n}{3}} x^{n-\frac{n}{3}} \cdot (x^{-2})^{\frac{n}{3}} \rightarrow \binom{n}{\frac{n}{3}} \cancel{x^{\frac{2n}{3}}} \cdot \cancel{x^{\frac{-2n}{3}}}$

$\binom{n}{\frac{n}{3}}$ → Só é verdadeiro se o numerador e denominador forem naturais, ou seja, para que isso seja verdadeiro n tem que ser divisível por 3.

$\boxed{\text{Alternativa C}}$

6.

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

$(3x^3 + 2x^{-2})^5 = \binom{5}{0} \cdot (3x^3)^5 \cdot (2x^{-2})^0 + \binom{5}{1}(3x^3)^4 \cdot (2x^{-2})^1 \rightarrow$

$\rightarrow + \binom{5}{2}(3x^3)^3 \cdot (2x^{-2})^2 + \binom{5}{3}(3x^3)^2 \cdot (2x^{-2})^3 + \binom{5}{4}(3x^3)^1 \cdot (2x^{-2})^4 \rightarrow$

$\rightarrow \binom{5}{5}(3x^3)^0 \cdot (2x^{-2})^5 = 243x^{15} + 810x^{10} + 1080x^5 + 720 + \frac{240}{x^5} + \frac{32}{x^{10}}$

$K = 243x^{15} + 810x^{10} + 1080x^5 + 720 + \frac{240}{x^5} + \frac{32}{x^{10}} - \left(243x^{15} + 810x^{10} + 1080x^5 + \frac{240}{x^5} + \frac{32}{x^{10}}\right)$

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

$\boxed{K = 720}$ $\boxed{\text{Alternativa E}}$

7. $(2x + y)^5 \rightarrow (2 \cdot 1 + 1)^5 \rightarrow 3^5 = \boxed{243}$

$\boxed{\text{Alternativa C}}$