Arthur Hernandes Silva de Souza **CTII 350**

Teorema do Binômio

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①

$$\binom{6}{k} x^{6-k} y^{k} \Big| \binom{6}{k} 1^{6-k} 2x^{2k} = ? x^{8}$$

$2k = 8$
$k = 4$

$$\binom{6}{4} = \frac{4! \cdot 30}{4! \cdot 2}$$

$$15 \cdot 1^{6-4} \cdot 2^{4} x^{8} = 15 \cdot 16 x^{8} = 240 x^{8}$$

Letra C

②

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

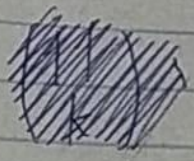
$x = 1$
$y = 1$

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

Letra B

③

$(x+a)^{11}$



$k = 11-5$

$k = 6$

$\binom{11}{6} = 462$

$462 \cdot a^6 = 1386$

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

$a^6 = 3$

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

Letra A

④

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

$\binom{9}{k} x^{9-k} \, x^{-2k} = x^0$

$9 - k - 2k = 0$

$9 - 3k = 0$

$9 = 3k$

$k = 3$

Letra D

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

$n - k - 2k = 0$
$n - 3k = 0$
$n = 3k$

Letra C

6.

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

Linha 5 triângulo de Pascal

1 5 10 10 5 1

$1 \cdot (3x^3)^5 \cdot (2x^{-2})^0 = 243x^{15}$
$5 \cdot (3x^3)^4 \cdot (2x^{-2})^1 = 810x^{10}$
$10 \cdot (3x^3)^3 \cdot (2x^{-2})^2 = 1080x^5$
$10 \cdot (3x^3)^2 \cdot (2x^{-2})^3 = 720$
$5 \cdot (3x^3)^1 \cdot (2x^{-2})^4 = \frac{240}{x^5}$
$1 \cdot (3x^3)^0 \cdot (2x^{-2})^5 = \frac{32}{x^{10}}$

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

Letra E

f.

$(2x + y)^5$

$x = 1$

$x = 1$

$3^5 = 243$

Otro. C