Nome: Paola Martins da Silva_____ - **CTII 317** – **DATA:** 22/07/21

TAREFA BÁSICA 10

Teorema de Binômio

01) $(1+2x^2)^6 \rightarrow 1.1^6.(2x^2)^0 + 6.1^5.(2x^2)^1 + 15.1^4.(2x^2)^2 + 20.1^3.(2\ )^3$
$+ 15.1^2.(2x^2)^4 + 6.1^1.(2x^2) + 1.1^0.(2x^2)^6 =$

$\Rightarrow 1.1.1 + 6.1.2x^2 + 15.1.4x^4 + 20.1.8x^6 + 15.1.16x^8 + 6.1.32x^{10}$
$+ 1.64x^{12} =$

$\Rightarrow 64x^{12} + 192x^{10} + \boxed{240x^8} + 160x^6 + 60x^4 + 12x^2 + 1$

letra C

02) $(14x - 13y)^{237}$ $x = 1$ $y = 1$

$(14.1 - 13.1)^{237}$

$14 - 13 = 1^{237}$

coeficiente $= 1$

letra B

03) $(x+a)^{11} = 1386x^5 \rightarrow$ termo geral

$t_{K+1} = \binom{n}{K} . \cancel{x}^{n-K} . a^K$

$T_{K+1} = \binom{11}{K} . x^{11-K} . a^K = 1386x^5 \rightarrow 11 - K = 5 \rightarrow K = 5 - 11$

$K = 6$

$T_{6+1} = \binom{11}{6} . x^{11-6} . a^6 = 1386x^5$

$T_7 = \binom{11}{6} . x^5 . a^6 = 1386x^5$

$T_7 = \frac{11!}{6!} . a^6 = 1386$

$T_7 = \frac{11.10.9.8.7.\cancel{6}}{\cancel{6!}.5.4.3.2.1}$

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

$462a^6 = 1386$

$a^6 = \frac{1386}{462} = 3$

$\boxed{a = \sqrt[6]{3}}$ ~ letra A

04) $\left(x+\frac{1}{x^2}\right)^9 \to T_{9+1} = \binom{9}{K} \cdot x^{9-K} \cdot \left(\frac{1}{x^2}\right)^K$

$T_{9+1} = \binom{9}{K} \cdot x^{9-K} \cdot (x^{2-1})^K = \binom{9}{K} \cdot x^{\frac{9-K}{2}} \cdot x^{-K} = \frac{9-K}{2} - K = \binom{9}{K} \cdot x^{\frac{9-P}{2}-K} \to$

$\to \frac{9-K}{2} - \frac{2K}{2} = \frac{9-3K}{2} \to T_{9+1} = \binom{9}{K} \cdot x^{\frac{9-3K}{2}} \to \frac{9-3K}{2} = 0$

$9-3K=0$ letra D.

$9 = 3K \Rightarrow \boxed{K = \binom{9}{3}}$

05) $\left(x+\frac{1}{x^2}\right)^n \to T_{n+1} = \binom{n}{K} \cdot x^{n-K} \cdot \left(\frac{1}{x^2}\right)^K \to T_{n+1} = \binom{n}{K} \cdot x^{n-K} \cdot (x^{2-1})^K =$

$\Rightarrow \binom{n}{K} \cdot x^{\frac{n-K}{2}} \cdot x^K = \binom{n}{K} \cdot x^{\frac{n-K}{2}-K} \Rightarrow \frac{n-K}{2} - K = \frac{n-3K}{2} \to$

$\to T_{n+1} = \binom{n}{K} \cdot x^{\frac{n-3K}{2}} \to \frac{n-3K}{2} = 0$

$n = 3K \to \frac{3}{3} = 1$

letra C = se n é divisível por 3.

06) $\left(3 \cdot 1^3 + \frac{2}{1^2}\right)^5 - \left(234 \cdot 1^{15} + 810 \cdot 1^{10} + 1080^5 + \frac{240}{x^5} + \frac{32}{x^{10}}\right)$

$\to \left(3 \cdot 1 + \frac{2}{1}\right)^5$

$(3+2)^5$

$(5)^5 = 3125$

$234 + 810 + 1080 + 240 + 32 \Rightarrow$

$= 2405$

$\to 3125 - 2405 = \boxed{720}$ ~ letra E

07) $(2x+y)^5 \to \binom{5}{0} \cdot 2x^5 \cdot y^0 + \binom{5}{1} 2x^4 \cdot y^1 + \binom{5}{2} 2^3 \cdot y^2 + \dots \binom{5}{5} 2x^0 \cdot y^5$

$\binom{5}{0} 2^5 + \binom{5}{1} 2^4 + \binom{5}{2} 2^3 + \binom{5}{3} 2^2 + \binom{5}{4} 2^1 + \binom{5}{5} 2^0$

$= 2^5 + 5 \cdot 2^4 + 10 \cdot 2^3 + 10 \cdot 2^2 + 5 \cdot 2^1 + 1 \cdot 2^0$

$= 32 + 80 + 80 + 40 + 10 + 1 = \boxed{243}$ ~ letra C