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Turma: CTII 317

Teorema do Binômio

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

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

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

Letra C

02. $(14x - 134)^{237} = (14.1 - 13.1)^{237}$
$(14-13)^{237} = 1^{237} = 1$

Letra B

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

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

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

$T_1 = \frac{11!}{6!5!}\ a^6 = 1386$

$T_1 = \frac{11.10.9.8.7.6!}{6!5!}\ a^6 = 1386$

$T_1 = \frac{55440}{120}\ a^6 = 1386$

$462\ a^6 = 1386$

tilibra

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

$a^6 = 3$

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

Letra A

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

$(x^{-2})^k = \binom{9}{k} \cdot x^{\frac{9-k}{2}} \cdot x^{-k} = \frac{9-k}{2} - k = \binom{9}{k}$

$x \ \frac{9-P}{2} - k \to \frac{9-k}{2} - \frac{2k}{2} = \frac{9-3k}{2}$

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

$9 - 3k = 0 \qquad k = \binom{9}{3}$

$9 = 3k$

Letra D

05. $\left(x+\frac{1}{x^2}\right)^n \to x^{n-3k} = x^0$

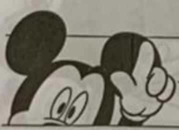
$n - 3k = 0$

$\boxed{n = 3k}$

(I) Se $n = 10$

$10 = 3k$

$k = \frac{10}{3} \qquad k = 3{,}333$ n não pode ser par!



(II) Se $n=7$

$7=3K$

$K=\frac{7}{3}$ $\quad K=2,333$

↳ Não pode ser qualquer ímpar

(III) Se $n=12$ → $12 \,|\, 3 = 4$

$12=3K$

$K=\frac{12}{3}$ $\quad K=4$ → Se é divisível por 3!

07. $(2x+y)^5$

$$(a+b)^n = \binom{n}{0}a^n b^0 + \binom{n}{1} a^{n-1} b^1 + \binom{n}{n-1} a^1 b^{n-1} + \binom{n}{n} a^0 b^n$$

$=2^5+5\cdot2^4+10\cdot2^3+10\cdot2^2+5\cdot2+1$

$=32+80+80+40+10+1=243$

Letra C