01 - $(1+2x^2)^6 =$

1 6 15 20 15 6 1

$\cancel{1^6} + \cancel{1^5} \cdot 2x^2 + \cancel{1^4} \cdot 4x^4 + \cancel{1^3} \cdot 8x^6 + \cancel{1^2} \cdot 16x^8 + \cancel{1} \cdot 32x^{10} + 64x^{12}$

$1 + 2x^2 + 4x^4 - 8x^6 + 16x^8 - 32x^{10} + 64x^{12}$

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

Resp: $240x^8$ ou C

02

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

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

B

03 - (UFOP) $(x+a)^{11} = 1386x^5$, a é igual:

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

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

$11 - K = 5$

$K = 6$

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

$T_7 = \frac{11 \cdot 10 \cdot 9 \cdot 8 \cdot 7 \cdot \cancel{6!}}{\cancel{6!}\, 5!} a^6 = 1386$

spiral®

$$T_7 = \frac{55440}{120} a^6 = 1386$$

$$462a^6 = 1386$$

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

$$a^6 = 3$$

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

A

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

$$T_{k+1} = \binom{9}{k} x^{9-k} \cdot (1)^k (x^{-2})^k$$

$$= (1)^k \binom{9}{k} x^{9-k} \, x^{-2k}$$

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

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

$9 - k - 2k = 0$
$9 - 3k = 0$
$-3k = -9$
$k = \frac{-9}{-3}$
$k = 3$

D

S T Q Q S S D ___/___/___

$$05 - \left(x + \frac{1}{x^2}\right)^n = (x - x^{-2})^n$$

$$T_{k+1} = \binom{n}{k} \cdot (x^1)^k \cdot (x^{-2})^{n-k}$$

$$T_{k+1} = \binom{n}{k} x^k \cdot x^{-2n-k}$$

$$T_{k+1} = \binom{n}{k} x^{k-2n-k}$$

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

$$T_{k+1} = \binom{2}{k} x^k \cdot (x^{-2})^{2-k}$$

Q7 (FaV) $(2x+y)^5$

$1 \quad 5 \quad 10 \quad 10 \quad 5 \quad 1$

$2x^5 + 2x^4 + y + 2x^3 + y^2 + 2x^2 + y^3 + 2x + y^4 + y^5$

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

$= 243$

C