DATA

Resolução

B.62 C ☑ D ☑

d) $3^{x-1} - 3^x + 3^{x+1} + 3^{x+2} = 306$

$3^x \cdot 3^{-1} - 3^x + 3^x \cdot 3^1 + 3^x + 3^2 = 306$

$3^x \left(3^{-1} - 1 + 3^1 + 3^2 \right) = 306$

$3^x \left(\frac{1}{3} - 1 + 12 \right) = 306 \Rightarrow 3^x \left(\frac{1}{3} + 11 \right) = 306 \Rightarrow$

$\Rightarrow \frac{1}{3} + \frac{11}{1} = \frac{1+33}{3} = \frac{34}{3}$ então $3^x * \frac{34}{3} = 306 \Rightarrow$

$3^x = \frac{306}{34/3} \Rightarrow 3^x = \frac{306}{1} \cdot \frac{3}{34} = \frac{918}{34}$ $2^x = \frac{918}{34}$

$918 \mid 34$
$68 \quad 27$
238
238
00

$3^x = 27 \Rightarrow 3^x = 3^3 \Rightarrow x = 3$

$S = \{3\}$

c) $2^{3x} + 2^{3x+1} + 2^{3x+2} + 2^{3x+3} = 240$

$2^{3x} + 2^{3x} \cdot 2^1 + 2^{3x} \cdot 2^2 + 2^{3x} \cdot 2^3 = 240$

$2^{3x} = z$ $\quad z + z \cdot 2 + z \cdot 4 + z \cdot 8 = 240$

$3z + 4z + 8z = 240$

$15z = 240 \Rightarrow z = \frac{240}{15} \Rightarrow z = 16$

$240 \mid 15$
$90 \quad 16$

$2^{3x} = 16$

$2^{3x} = 2^4 \Rightarrow 3x = 4 \Rightarrow x = \frac{4}{3}$ $S = \{\frac{4}{3}\}$