

B.158 - Resolução:

$$a) 2^x = 3^{x+2} \rightarrow 2^x = 3^x \cdot 3^2 \rightarrow \frac{2^x}{3^x} = 9 \rightarrow \left(\frac{2}{3}\right)^x = 9 \rightarrow$$

$$\boxed{\log_{\frac{2}{3}} 9} \quad S = \left\{ \log_{\frac{2}{3}} 9 \right\}$$

$$b) 7^{2x-1} = 3^{3x+4} \rightarrow \frac{7^{2x}}{7^1} = 3^{3x} \cdot 3^4 \rightarrow \frac{7^{2x}}{3^{3x}} = 7^1 \cdot 3^4 \rightarrow$$

$$\left(\frac{7^2}{3^3}\right)^x = 7 \cdot 81 \rightarrow \left(\frac{49}{27}\right)^x = 567 \rightarrow \log_{\frac{49}{27}} 567$$

$$S = \left\{ \log_{\frac{49}{27}} 567 \right\}$$

$$c) 5^{x-1} = 3^{4-2x} \rightarrow \frac{5^x}{5^1} = \frac{3^4}{3^{2x}} \rightarrow 5^x = \frac{3^4}{3^{2x}} \cdot 5^1 \rightarrow$$

$$5^x \cdot 3^{2x} = 3^4 \cdot 5^1 \rightarrow 5^x \cdot 3^{2x} = 81 \cdot 5 \rightarrow 5^x \cdot 3^{2x} = 405$$

$$\frac{5^x}{3^{2x}} = 405 \rightarrow \left(\frac{5}{3^2}\right)^x = 405 \rightarrow \left(\frac{5}{\left(\frac{3}{1}\right)^2}\right)^x = 405 \rightarrow$$

$$\left(\frac{5}{\frac{1}{9}}\right)^x = 405 \rightarrow \left(5 \cdot \frac{9}{1}\right)^x = 405 \rightarrow 45^x = 405$$

$$S = \left\{ \log_{45} 405 \right\}$$

$$\log_a b = x \leftrightarrow a^x = b$$