

Solución al problema de "Calcula en función de "a"

Enunciado:

$$\frac{x}{y} = \frac{a+2}{a-2}$$

$$\frac{x^2 - y^2}{x^2 + y^2} = ?$$

Solución:

$$x = \frac{a+2}{a-2} \cdot y \Rightarrow x^2 = \frac{(a+2)^2}{(a-2)^2} \cdot y^2 ; \text{ por tanto:}$$

$$x^2 - y^2 = \left(\frac{(a+2)^2}{(a-2)^2} - 1 \right) \cdot y^2 = \frac{(a+2)^2 - (a-2)^2}{(a-2)^2} \cdot y^2 = \frac{8a}{(a-2)^2} \cdot y^2$$

$$x^2 + y^2 = \left(\frac{(a+2)^2}{(a-2)^2} + 1 \right) \cdot y^2 = \frac{(a+2)^2 + (a-2)^2}{(a-2)^2} \cdot y^2 = \frac{2(a^2+4)}{(a-2)^2} \cdot y^2$$



$$\text{Luego: } \frac{x^2 - y^2}{x^2 + y^2} = \left(\frac{8a}{(a-2)^2} \cdot y^2 \right) \div \left(\frac{2(a^2+4)}{(a-2)^2} \cdot y^2 \right) = \frac{8ay^2 \cdot (a-2)^2}{2(a^2+4)y^2(a-2)^2} = \frac{4a}{a^2+4}$$