Ecuaciones de 2º grado incompletas

Ecuaciones exponenciales (Operar con exponentes)

LOGARITMOS

PROPIEDADES LOGARITMOS

$\log_c (a \cdot b) = \log_c a + \log_c b$

$\log_c \left(\frac{a}{b}\right) = \log_c a - \log_c b$

$\log_c a^b = b \log_c a$

$\log_c a = \frac{\log_d a}{\log_d c}$

Ej

$\ln e^2 = \log_e e^2 = 2$ pq. $e^2 = e^2$

$\ln \frac{1}{e^3} = -3$ pq. $e^{-3} = \frac{1}{e^3}$

$\ln \sqrt[5]{e^2} = \frac{2}{5}$ pq. $e^{\frac{2}{5}} = \sqrt[5]{e^2}$

① $\underbrace{\log x + \log 50}_{} = 3$

$\cancel{\log}(50x) = \cancel{\log} 1000$

$50x = 1000$

$50x = 1000$

$x = \frac{1000}{50} = 20$

② $5 - \log_2 (x+3) = \log_2 32 \rightarrow \log_2 (x+3)^5 = \log_2 (2^5) \rightarrow$

$\Rightarrow (x+3)^5 = 2^5$

$\rightarrow \sqrt[5]{(x+3)^5} = \sqrt[5]{2^5} \rightarrow x+3 = 2 \rightarrow x = -1$

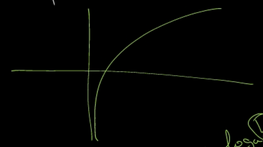
③ $2 \log x = \log (10 - 3x)$

$\cancel{\log}(x)^2 = \cancel{\log}(10-3x)$

$x^2 = 10 - 3x \Rightarrow 0 = -x^2 - 3x + 10$

$x = \frac{3 \pm \sqrt{9+40}}{-2} = \frac{3 \pm 7}{-2}$ $\begin{cases} -5 \rightarrow \text{No vale} \\ 2 \end{cases}$

Solución



No! $\log(-5)$

$\log(b)$ $\boxed{b \geq 0}$

④ $\log(x^2+1) - \log(x^2-1) = \log \frac{13}{12} \Rightarrow \log\left(\frac{x^2+1}{x^2-1}\right) = \log \frac{13}{12} \Rightarrow$

$\frac{x^2+1}{x^2-1} = \frac{13}{12} \Rightarrow \frac{12x^2+12}{12(x^2-1)} = \frac{13x^2-13}{12(x^2-1)} \Rightarrow 12x^2+12 = 13x^2-13 \Rightarrow 0 = x^2-25 \Rightarrow$

$\sqrt{25} = \sqrt{x^2} \Rightarrow x = \pm 5$ → Valen las dos soluciones

⑤ $\ln x + \ln(2x) + \ln(4x) = 3$

$\cancel{\ln}(x \cdot 2x \cdot 4x) = \cancel{\ln} e^3 \Rightarrow 8x^3 = e^3 \rightarrow x^3 = \frac{e^3}{8}$

$\sqrt[3]{8x^3} = \sqrt[3]{e^3}$

$2x = e$

$x = \frac{e}{2}$

$\sqrt[3]{x^3} = \sqrt[3]{\frac{e^3}{8}}$

$\boxed{x = \frac{e}{2}}$