October 27, 2017

4-3 Solving Exponential and Logarithmic equations

Objectives:

I can solve exponential and logarithmic equations both graphically and algebraically.

$4^{2x} = 256$ $\log_4$

$\log_4$ $\therefore$

$2x = \log_4 256$

$\frac{2x}{2} = \frac{4}{2}$

$x = 2$

$\log_4 4^{2x} = \log_4 250$

$2x = \log_4 250$

$\frac{2x}{2} = \frac{3.99\ldots}{2}$

$x = 1.99\ldots$

$\log_e e^{(x-1)} = \log_e 5$

$x - 1 = \ln 5$

$+1 \qquad +1$

$x = 1.6$

$$\frac{10}{5} = \frac{5e^{4x}}{5}$$

$$\ln 2 = \ln e^{4x}$$

$$\ln 2 = 4x$$

$$\frac{.69}{4} = \frac{4x}{4}$$

$$x = .17$$

$$5^{x-1} - 4 = 7$$

$+4 \quad +4$

$\log_5 5^{x-1} = \log_5 11$

$$\ln x = 4$$

$e^4 = x$

$10.6 = x$

$$\frac{2\ln(x+1)}{2} = \frac{4}{2}$$

$$\ln(x+1) = 2$$

$$e^2 = x+1$$

$$-1 \qquad -1$$

$$x =$$

$$\log_3(2x-4)=4$$

$3^4=2x-4$

$81=2x-4$

$+4 \quad +4$

$\frac{85}{2}=\frac{2x}{2}$ $x=42.5$

$$6^{3x}=12$$

$\log 6^{3x}$ $\log 12$ $X=.462$

Solve the following

$$\log(4x)=2$$

$$4\ln(x+7)-5=1$$

Your house cost $250,000 and appreciates at a rate of 3% every year. How long will it take to reach $300,000?

$$250{,}000(1+.03)^x = 300{,}000$$

$250{,}000 \qquad 250{,}000$

$$\log_{1.03}(1.03)^x \qquad \log_{1.03} 1.2$$

$$x = 6.16$$