



December 3

SWBAT:

Solve Exponential Equations

Rewrite

$$\ln(\sqrt[5]{x^3}) = \ln((x^3)^{1/5})$$

$$= \ln(x^{3/5})$$

$$= \frac{3}{5} \ln(x)$$

$$\sqrt[n]{(\sim)} = (\sim)^{1/n}$$

$$\ln(\sqrt[6]{A^5 B}) = \ln((A^5 B)^{1/6})$$

$$= \ln(A^{5/6} B^{1/6})$$

$$= \ln(A^{5/6}) + \ln(B^{1/6})$$

$$= \frac{5}{6} \ln(A) + \frac{1}{6} \ln(B)$$

$$\ln(c) + 4\ln(d) = \ln(c) + \ln(d^4)$$

$$= \ln(c \cdot d^4)$$

$$\ln(f) + 7\ln(g) - 2\ln(h+4)$$

$$= \ln(f) + \ln(g^7) - \ln((h+4)^2)$$

$$= \ln(f \cdot g^7) - \ln((h+4)^2)$$

$$= \ln\left(\frac{f \cdot g^7}{(h+4)^2}\right)$$

Solve

$$e^{2x} = 14$$

$$e^x \rightarrow \text{inverse} = \ln x$$

$$\ln(e^{2x}) = \ln(14)$$

$$2x \cdot \ln(e) = \ln(14)$$

$$2x(1) = \ln(14)$$

$$\frac{2x}{2} = \frac{\ln(14)}{2}$$

$$x = \frac{\ln(14)}{2}$$

$$x = 1.3195 \rightarrow 3.12$$

take the
natural log
of both sides

$$\ln(e) = y$$

$$\log_e e = y$$

$$e^y = e^1$$

$$y = 1$$

Solve

$$e^{3x-1} = 27$$

$$\ln(e^{3x-1}) = \ln(27)$$

$$(3x-1) \ln(e) = \ln(27)$$

$$(3x-1)(1) = \ln(27)$$

$$3x-1 = \ln(27)$$

$$\begin{array}{r} +1 \qquad +1 \\ \hline 3x = \ln(27) + 1 \\ \hline \frac{3x}{3} = \frac{\ln(27) + 1}{3} \end{array}$$

$$x = \frac{\ln(27) + 1}{3}$$

$$x = 1.432$$

Solve

$$4^x = 72$$

$$\ln(4^x) = \ln(72)$$

$$\frac{x \cdot \ln(4)}{\ln(4)} = \frac{\ln(72)}{\ln(4)}$$

$$x = \frac{\ln(72)}{\ln(4)}$$

$$x = 3.085$$