5-3 Solving Exponential and Logarithmic equations

Objectives:

5-3a: I can solve exponential and logarithmic equations graphically.

5-3b: I can solve exponential and logarithmic equations algebraically.

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RECALL: Solving Graphically

$$275e^{0.06x} = 1000$$

$y_1 =$ $y_2 =$

$$10^{2x} = 1500$$

$y_1 =$ $y_2 =$

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Now you try...solve the exponential & logarithmic equations graphically.

$$20^{2r} = 56$$

$y_1 =$ $y_2 =$

$$e^{.23x} = 1.99$$

$y_1 =$ $y_2 =$

Inverses

Addition/Subtraction	Natural Log/e^	Common Log/10^	Log base b/b^
$x - 5 = 10$	$e^x = 5$	$10^x = 100$	$2^x = 16$
$x + 7 = 21$	$\ln x = 7$	$\log x = 3$	$\log_3 x = 4$

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Solve the following equations

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

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

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

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

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Solve the following

$$\ln(x + 12) = 3\ln 2$$

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

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

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Solve the following

$$\log(x+2)-3=5$$

$$\log_4(x-1)=1$$

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Compound Interest Formula

$$A(t)=P\left(1+\frac{r}{n}\right)^{nt}$$

P is the principal

r is the annual interest rate

n is the number of compounding periods per year

t is the time in years

Feb 15-11:03 AM

Many banks compound the interest on accounts daily or monthly. However, some banks compound interest continuously, or at every instant, by using the *continuous compounding formula.*

Continuous Compounding Formula

If *P* dollars are invested at an interest rate *r*, that is compounded continuously, then the amount, *A*, of the investment at time *t* is given by

$$A(t) = Pe^{rt}$$

P is principal (initial value)

r is interest rate

t is time (in years)

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How long will it take for a $250 initial investment in an account that pays 4.5% compounded continuously to grow to $750?

Suppose that $250 is deposited into an account that pays 4.5% compounded quarterly. Solve for t to find how long it will take for the account to contain at least $500.

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Comparing acidity: $pH = -\log\left[H^+\right]$

$\left[H^+\right]$ = hydrogen-ion concentration

Vinegar has a pH of 2.4. What is it's hydrogen ion concentration?

Baking soda has a pH of 8.4. What is it's hydrogen ion concentration?

Which has a higher hydrogen ion concentration?

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Nov 12-1:49 PM