

Day 6 Algebra II Warm Up 2-10-15

$f(x) = x^3 + 2x^2 - 8x$

x-int: $(-4, 0), (2, 0), (0, 0)$
 y-int: $(0, 0)$
 rel min: $(1, -5)$
 rel max: $(-2, 17)$
 primarily increasing: $QIII + QI$
 primarily decreasing: _____
 domain: $(-\infty, \infty)$
 range: $(-\infty, \infty)$

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Solve Exponential and Logarithmic Equations

1. $2^x = 64$ 2. $2^{x-3} = 8$ 3. $27^{x-3} = 243$

$\log_2 64 = x$ $\log_2 8 = x-3$ $\log_{27} 243 = x-3$
 $\frac{\log(64)}{\log(2)} = x$ $\frac{\log 8}{\log 2} = x-3$ $\frac{\log 243}{\log 27} = x-3$
 $x = 6$ $3 = x-3$ $1.67 = x-3$
 $+3$ $+3$
 $6 = x$ $4.67 = x$

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Solve the exponential equation.

4. $e^{2x} = 5$ 5. $8^{4x} = 14$ 6. $5^{3x} = -10$

$\ln 5 = 2x$ $\log_8 14 = 4x$ $\log_5 -10 = 3x$
 $\frac{1.61}{2} = \frac{2x}{2}$ $\frac{\log 14}{\log 8} = 4x$ $\frac{\log -10}{\log 5} = 3x$
 $.81 = x$ $\frac{1.2}{4} = \frac{4x}{4}$ No Solution
 (log_e = ln) $.32 = x$

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Solve the Logarithmic Equation.

7. $\log_6(2x+8) = \log_6(6x-12)$ 8. $\ln(7x-4) = \ln(2x+11)$

$2x+8 = 6x-12$ $7x-4 = 2x+11$
 $\frac{2x}{7} = \frac{6x-12}{8}$ $+4$ $+4$
 $2x = 6x-20$ $7x = 2x+15$
 $-6x$ $-2x$
 $-4x = -20$ $5x = 15$
 $\frac{-4x}{-4} = \frac{-20}{-4}$ $\frac{5x}{5} = \frac{15}{5}$
 $x = 5$ $x = 3$

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Solve the Logarithmic Equations

9. $\log_7(3x-2) = 2$ 10. $\ln(5x+4) = 3$

$$7^2 = 3x - 2$$

$$\frac{49}{+2} = \frac{3x-2}{+2}$$

$$\frac{51}{3} = \frac{3x}{3}$$

$$x = 17$$

$$e^3 = 5x + 4$$

$$\frac{20.09}{-4} = \frac{5x+4}{-4}$$

$$\frac{16.09}{5} = \frac{5x}{5}$$

$$x = 3.22$$

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Biologists use the logarithmic model

$n = 1037.43 \log_{65} A$ to estimate the number or species (n) that live in a region of area (A).

Find the number of species that live in a rain forest of 500 square kilometers if half of this rain forest is destroyed by logging.

$$\approx 2487.69$$

$$\approx 2488$$

Feb 6-9:03 AM

Each pair of you will be given 5 cards. You need to pair them up, equation and answer. Please raise your hands when finished so I can check. **Each pair needs one piece of paper and put both your names on it.**

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Conclusion Put on partner solving paper. Turn in today.

1. What do you do when you don't think you can solve the equation?

2. Can you take the logarithm of a negative number?

3. Rate yourself on solving log and exponential equations.

{1 to 5, 1 being not good, and 5 awesome}

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Day 6
Assignment
Solving Exponential and
Logarithmic Equations
Worksheet

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