Bellwork Friday, March 21, 2014

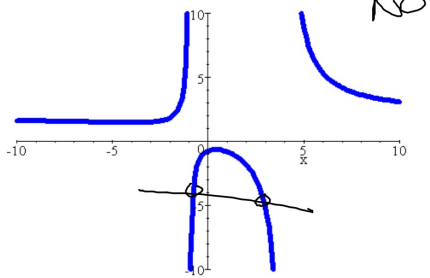
1. Write the equation of the inverse of the relation below:

$$y = \frac{2 \cdot \sqrt[5]{\frac{4x^2 - 1}{5}} + 7 - 8}{11} + 3$$

$$5\left(\left(\frac{11(x-3)+8}{2}\right)^5 - 7\right) + 1$$

4

2. Is the inverse a function? $y = \frac{2x^2 + 3}{x^2 - 3x - 4}$



NO

Graph doesn't pass the horizontal line test.

3. Does each represent exponential Growth or Decay?

a) $y = 12{,}500(0.99879)^{-x}$ G

b) $y = 0.32(1.0031)^{x}$ G

4. State the % change modeled by this equation and state if it's an increase or a decrease.

$y = 4800(1.0105)^{x}$ 101.05 1.05% INC

5. Find the base for the exponential give the following percent change.

22.401% decrease

$100 - 22.401 = 77.599\%$

$b = .77599$

6. The population in a city has been decreasing 2.7% each year. The population in 2004 was 142,000.

a. Find the population in 1999 $142000(.973)^{-5}$ 162,826

b. Find the number of years until the population reaches 100,000. Round to the nearest hundredth.

$\frac{100{,}000}{142{,}000} = \frac{142000(.973)^{x}}{142000}$

$100/142 = .973^{x}$

$\log_{.973}\left(\frac{100}{142}\right) = x$

12.8 / yrs

7. Write each in logarithmic form.

a) $12^x = 500$ $\log_{12} 500 = x$

b) $x^4 = 35$ $\log_x 35 = 4$

8. Write each in exponential form.

a) $\log 7 = x$ $10^x = 7$

b) $\log_6 X = 2$ $6^2 = X$

9. Use all three properties of logarithms to expand the following expression:

$\log_4 \frac{C^2}{(B^5 \cdot \sqrt[3]{A})^2}$ B^{10} $A^{2/3}$

$2\log_4 C - 10\log_4 B - \frac{2}{3}\log_4 A$

10. Use all three properties of logarithms to write as a single logarithm:

$5\log_2 P - \frac{1}{2}\log_2 Q + 4\log_2 R$

$\log_2 \frac{P^5 R^4}{\sqrt{Q}}$

11. Solve. $8 \cdot 3^{2x+7} - 2 = 50$

$3^{2x+7} = 6.5$

$\log_3 6.5 = 2x+7$

$X = -2.65$

12. Solve. $\log_2(7x+4) - 2\log_2 x = 1$

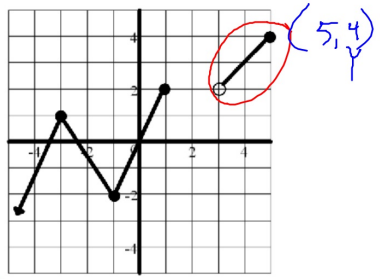
$\log_2 \frac{7x+4}{x^2} = 1$ $x^2 \cdot 2^1 = \frac{7x+4}{x^2} \cdot x^2$

$2x^2 = 7x+4$

$2x^2 - 7x - 4 = 0$ $(2x+1)(x-4) = 0$

$x = 4, -\frac{1}{2}$

13. Find the domain and range of the inverse of this relation:



original

D $3 < x \leq 5$, $x \leq 1$

R $y \leq 4$

inverse

D: $x \leq 4$

R $3 \leq y \leq 5$, $y \leq 1$