review

September-17-13 7:20 PM

Used 2012

MCR

1. Simplify each expression

a) $\dfrac{2x^4y^{-4}z^{-3}}{3x^2y^{-3}z^4}$

b) $\dfrac{\sqrt[10]{1024x^{20}}}{\sqrt[9]{512x^{27}}}$

c) $\left(\dfrac{(6x^3)^2(6y^3)}{(9xy)^6}\right)^{-\frac{1}{3}}$

2. Solve each equation, if possible.

a) $26 = -1 + (27x)^{\frac{3}{4}}$

b) $3 \bullet 3^{-2x+1} \bullet 3^{-2x-3} = 81^{-x}$

c) $9^{x-1} + 3 = 81$

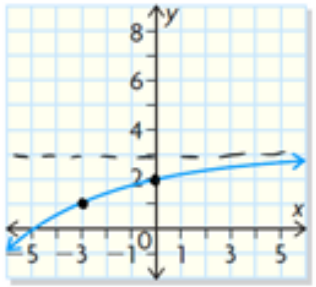
3. $g(x) = 5(3.5)^{\frac{8-x}{2}} - 10$

a) Simplify the equation into the form $y = ab^x + c$

b) State the parent function of the answer in a., and the transformations

c) Sketch and label asymptote and y-int

4. Find the equation for the graph



5. A certain type of bacteria currently cover 12% of the surface

5) A certain type of bacteria currently cover 12% of the surface of a pond, and the bacteria grow at a rate of 8% every 3 weeks. What percent of the pond will be covered with bacteria in 10 weeks?

6) The population of a city has seen a recent rapid increase. Three years ago, the city had 200 residents, one year ago it had 5000 residents, and this year, there are 25 000 residents. When will the city's population exceed one million residents for the first time?

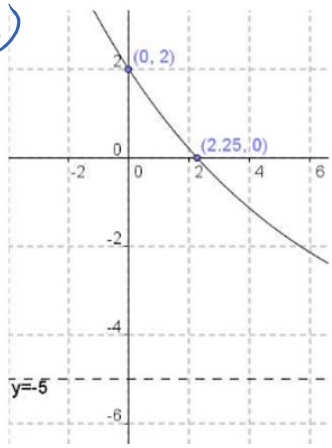
7) An ant colony population is cut in four every month. Currently, there are 16 000 in the nest. What is the monthly decay rate of the population?

8) Find the equation for

a)

x	1	2	3	4	5
y	1	−5	−17	−41	−89

b)



MHF Used 2011-1

1) Evaluate the logs without using a calculator

a	b	c	d	e
$\log_2 32$	$\log_{343} 7$	$\ln(e^5)$	$\log_3(-3)$	$\log_3 0$

f	g	h	i	j
$\log_4 1$	$\log_3 27^x$	$\log_2 (1/4)^x$	$\log_2 4^x$	$\log_e \left(\frac{1}{e^3}\right)$
k	l	m	n	o
$\log_{1/4} 256$	$\log_a \left(\frac{1}{a^3}\right) - \log_a \left(a^2\right)$	$3e^{2\ln(5)}$	$4\ln\left(\sqrt{e^{(x+1)}}\right)$	$\ln(e^2 \ln e^3)$

2. Solve the following.

a) $4^{x+3} - 4^x = 63$

b) $9^{n+10} + 3 = 81$

c) $\frac{\log(35 - x^3)}{\log(5 - x)} = 3$

d) $\log_7(x + 1) + \log_7(x - 5) = 1$

3. Solve

a) $5e^{3x-1} - 12 = 8$

b) $4\ln(5x - 3) + 12 = 20$

4. $y = \log_4 (3x + 11) - 5$

a) Find the inverse equation.

b) Sketch both the function and its inverse.

5. A new car has an interior sound level of 70 dB at 50 km/h. A second car, at the same speed, has an interior sound level that is two times more intense than that of the new car. Calculate the sound level inside the second car.

6. Calculate the pH of a swimming pool with a hydrogen ion concentration of 6.21×10^{-8} mol/L.

7. If one earthquake has a magnitude of 5.2 on the Richter scale and a second earthquake has a magnitude of 6, compare the intensities of the two earthquakes.

of the two earthquakes.

8 Set up the piecewise model for:

Bacteria divides into two every 20 minutes. If you start with a 3000 sample and after 1 hour apply an antibacterial solution, the bacteria population decreases at 1000 bacterium per minute for the first 5 minutes and then remains constant for 2 minutes before it starts to divide again.

9

True or False?

1) $\ln 0 = 1$

2) $\log_b xy = (\log_b x)(\log_b y)$

3) $\log_b (x+y) \neq \log_b x + \log_b y$

4) $\frac{\log A}{\log B} = \log\left(\frac{A}{B}\right)$

5) $3\log_b \sqrt[3]{a} = \log_b a$

6) $\log_{\frac{4}{3}} y = -\log_{\frac{3}{4}} y$

7) $\frac{1}{3}\log b^3 = \log b$

8) $\log_b (x+y) = (\log_b x)(\log_b y)$

9) $\ln(-x) = -\ln x$

10) $\log_b \frac{1}{a} = -\log_b a$

11) $\log xy^2 = 2\log y + \log x$

12) $\log(4p) = 4\log p$

10

	Which version(s) are true for $x \in \Re$?		
A.	$\sqrt{x}, x \in \Re$	$\sqrt{x}, x \geq 0$	
B.	$\sqrt{x^2} = x, x \in \Re$	$\sqrt{x^2} = \lvert x \rvert, x \in \Re$	$\sqrt{x^2} = x, x \geq 0$
C.	$\sqrt[3]{x^3} = x$	$\sqrt[3]{x^3} = \lvert x \rvert$	
D.	$\sqrt[4]{x^4} = x$	$\sqrt[4]{x^4} = \lvert x \rvert$	
E.	$\sqrt[5]{x^5} = x$	$\sqrt[5]{x^5} = \lvert x \rvert$	
F.	$\sqrt[5]{x^5} = x$	$\sqrt[5]{x^5} = \lvert x \rvert$	
G.	$\sqrt{x^{10}} = x^5$	$\sqrt{x^{10}} = \lvert x \rvert^5$	
H.	$\sqrt{x^4} = x^2$	$\sqrt{x^4} = \lvert x \rvert^2$	
I.	$\sqrt{x^5} = x^2\sqrt{x}, x \in \Re$	$\sqrt{x^5} = x^2\sqrt{x}, x \geq 0$	