Precalculus Chapter 3 Review

Show all work to get any possible partial credit.



1.) Identify the asymptotes and intercepts for the following functions. If they don't exist, write NONE.

	a.) $f(x) = 5^{x-3} - 2$
0 = 5 -2	domain R horizontal asym. $\sqrt{=-2}$
2=543	x-intercept 3.43
19=2=X-3	y-intercept - 249
+L0952 -X	5 -2 125

3

b.) $f(x) = \log_2(12x+6)-3$	12x+6>6
domain $X > \frac{1}{2}$	0= Log (12x16) -3
vertical asym. $X = \frac{1}{2}$ x-intercept $\frac{1}{6}$	3 = Log ((2x+6)
y-intercept4/5	8 = 12x+6
<u> </u>	12-12×

2.) How much is the account worth after 7 years if \$3560 was invested in an account that earned 4.75% b.) continuously?
A = 3560@ 0475.7 compounded a.) monthly? $A = 3560 \left(1 + \frac{.0475}{13.7}\right)^{12.7}$ 2.) a.) \$ 4960,98 b) \$ 4964.24

3.) How much interest was earned in the account from question #2 when it was compounded monthly?

4.) Write the logarithmic equation in exponential form or write the exponential equation in logarithmic form. Circle your answer.

a.)
$$\log_7 16807 = 5$$

b.)
$$\ln(3x+y) = 2$$

$$e^2 = 3x+y$$

c.)
$$9^{-2} = \frac{1}{81}$$

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$$ln(3x+y)=2$$
 c.) $9^{-2}=\frac{1}{81}$ d.) $a^{8x}=4y$

5.) Suppose $\log_a 4 = 2.4$, $\log_a 5 = 2.7$, and $\log_a 7 = 3.2$, use this information to find the value of

a.)
$$\log_a \frac{28}{5} = 2.9$$

$$\log_a 7.4 - \log_a 5$$

$$g_a 7 + \log_a 4 - \log_a 5$$

b.)
$$\log_a 20 - \log_a 35 = \frac{-8}{(\log_a 4 + \log_b 5)} - (\log_a 7 + \log_b 5)$$

 $(2.4 + 2.7) - (3.2 + 2.7)$

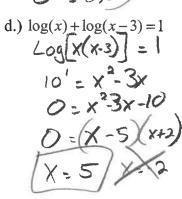
expression.

7.) Solve for the variable. Put all answers on the right. Show all work for possible partial credit.

a.)
$$2^{-x} = 8$$

 $-x = 103.8$
 $-x = 3$
c.) $\log_{6}(9x - 12) = 3$
 $6 = 9x - 12$
 $216 = 9x - 12$
 $228 = 9x$
 $228 = 9x$
 $228 = 9x$
e.) $\ln(x+4)^{2} = 6$
 $2 \ln(x+4) = 6$
 $2 \ln(x+4) = 6$
 $2 \ln(x+4) = 6$
 $2 \ln(x+4) = 3$
 $2 - 4$

b.)
$$8e^{x-7} + 15 = 59$$
 $8e^{x-7} = 44$
 $8e^{x-7} = 44$
 $8e^{x-7} = 5.5$
 $8e^{x-7} = 44$
 $8e^{x-7} = 5.5$
 $8e^{x-7} = 44$
 $8e^{x-7} = 5.5$
 $8e^{x-7} = 6.9$
 $8e^{x-7} = 6.9$



c.)
$$\frac{228}{9} \approx 25\frac{1}{3}$$

d.) $\frac{5}{4}$
e.) $e^{3}-4\approx 16.085$

- 8.) Suppose the height h (in feet) of a tree at age t (in years) is $h = \frac{120}{1 + 200e^{-0.2t}}$
 - a.) What is the height of the tree when it is 10 years old?
 - b.) What is the height of the tree when it is 50 years old?
- a) $h = \frac{120}{1+200e^{-2}}$ b) $h = \frac{120}{1+200e^{-10}}$ c) $103 = \frac{120}{1+200e^{-2t}}$ (round to four decimals) $103 = \frac{120}{1+200e^{-2t}}$ b) $h = \frac{120}{1+200e^{-10}}$ c) $103 = \frac{120}{1+200e^{-2t}}$ c) $103 = \frac{12$
 - 9.) The radioactive isotope Hartlandium decays according to formula: $(t) = H_0(0.5)^{t/30}$, where H_0 is the initial amount of the isotope and t is the time in days.

What is the half-life of Hartlandium (in days)?

$$\frac{1}{2}H_{o} = H_{o}\left(\frac{1}{2}\right)^{\frac{1}{2}/30}$$

$$= \left(\frac{1}{2}\right)^{\frac{1}{2}/30}$$

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a.) 4.275' b.) 118.92'

10.) Suppose you are driving your car when it is 20° F outside and your engine overheats at 220° F. When you park, the engine begins to cool down. The temperature T of the engine t minutes after you

park satisfies the equation, $\ln\left(\frac{T-20}{200}\right) = -0.11t$.

a.) How many minutes will it take for the engine to cool down to
$$100^{\circ}$$
 F?
$$\frac{100-20}{200} = -.11 \pm \frac{91639}{100} = -.11 \pm \frac{832}{100}$$

b.) What is the temperature after 5 minutes?

$$200.e^{-55} = \frac{T-20}{300} = 55$$
 $115.3899 = T-2$
 $135.3899 = T-2$