PAP Algebra

Chapter 12 Test Review

Solving Exponential/Log Equations (Common Base or by Converting)

1)
$$2^x = 16$$

$$4^{3x} = \left(\frac{1}{8}\right)^{2x+1}$$

$$2^{2(3x)} = 2^{-3(2x+1)}$$

$$6x = -6x - 3$$

3)
$$3(e)^x + 3 = 9$$

4)
$$4(e)^{x+5} - 8 = 12$$

5)
$$\left(\frac{1}{3}\right)^{x} = 27$$

$$3^{-1} = 3^{3}$$

$$-x=3$$
 $x=-3$

6)
$$\log_2(x^2 + 3x - 10) = 3$$

$$2^3 = x^2 + 3x - 10$$

 $8 = x^2 + 3x - 10$

7)
$$3\ln(x+5) = 21$$

$$x = e^2 - 5$$
 or $x = 1091.633$

8)
$$2\log_7(4) - \log_7 x = \frac{2}{3}\log_7 8$$

10)
$$\log_{6}(3x) - 10 = -8$$

 $+10 + 10$
 $\log_{6}(3x) = 2$
 $6^{2} = 3x$
 $36^{2} = 3x$
 $x = 12$
11) $\ln(x) = 13 - \ln(x^{2})$
 $\ln(x) + \ln x^{2} = 13$
 $\ln(x) = 13$
 $\ln(x) = 13$
 $\ln(x) = 13$
 $\ln(x) = 13$

12)
$$\log_3(x+8) - \log_3(x-4) = 2$$

$$| \circ g_3 \frac{x+8}{x-4} = 2$$

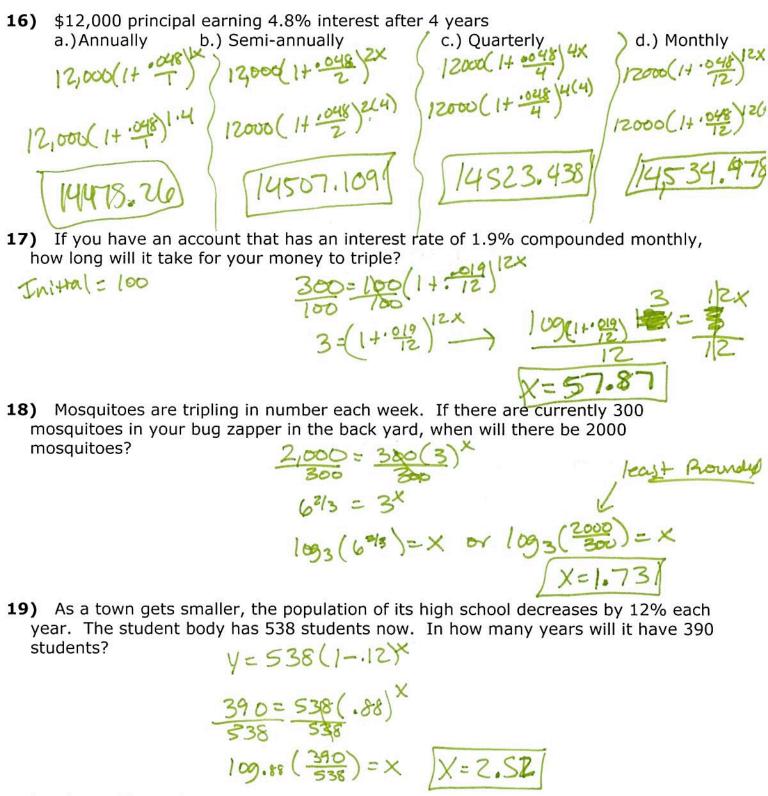
$$| \circ g_3 \frac{x+8}{x-4} = 2$$

$$| \circ g_4 \frac{x+8}{x-4} = 3$$

$$| \circ g_4 \frac{x+$$

Word Problems (Setting Up & Solving)

15) Is it better to invest your money at 5.5% interest compounded continuously or at 5.8% interest compounded monthly if you have \$12,000 to invest for 4 years?



20) The world population in 2000 was approx. 6.08 billion. The annual rate of increase was about 1.26%. If the world population continues to grow at this rate, when will the population reach 9 billion?

$$9 = 6.08e$$

$$9 = 6.08e$$

$$10.08e$$

21) Nobelium-259 has a half-life of 58 minutes. How much remains of a 1 kg sample after 1 day?

$$y = 1(42)^{\frac{1}{58}}$$

$$y = 3.359 \times 10^{-8}$$

22) Dubnium-262 has a half-life of 34 seconds. How many grams did we begin with if, after 5 minutes, we are left with only 1 gram?

23) Your parents bought a boat for \$60,000. The boat will depreciate by 9.3% each year. When will the boat be worth \$10,000?

$$\frac{10,000}{69,000} = \frac{60,000}{60,000}$$

$$\frac{1}{6} = (1-.093)^{X}$$

$$199,907 \frac{1}{6} = X$$

$$X = 18.36$$

4 300

24) If a population of 175 red-spotted toads doubles every 2 years, how many toads can you expect to find in 10 years?

25) A student wants to have \$8000 for college 5 years from now. How much should she put into an account that earns 5.2% annual interest compounded continuously?

$$\frac{8,000 = \times e^{.052(5)}}{e^{.072(5)}}$$

$$\frac{6,168.41 = X}{2.962(5)}$$