TEST REVIEW Unit 6: L1-8
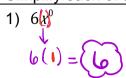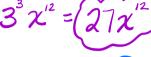
Simplify each of the following expressions without the use of negative or zero exponents.

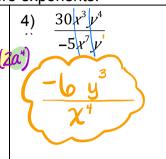| 1) $6(x)^0$	2) If the expression $(3x^4)^3$ was written in ax^b form, what is the sum of a and b?	3) $(-6ab^3)^3(2a^4)$	4) $\dfrac{30x^3y^4}{-5x^7y'}$
$6(1) = \boxed{6}$ *Anything to 0 power equals 1.	$3^3 x^{12} = \boxed{27x^{12}}$ $27 + 12 = \boxed{39}$	$(-6ab^3)(-6ab^3)(-6ab^3)(2a^4)$ $\boxed{-432a^7b^9}$	$\dfrac{-6y^3}{x^4}$

For each of the following exponential functions identify the y-intercept and whether the function is increasing or decreasing.

5) $y = 12(9.24)^x$	6) $y = -6(.25)^x$	7) $f(x) = 55\left(\dfrac{8}{9}\right)^x$	8) $g(x) = 1(10)^x$
y-int (12), rate (9.24) y-int: **12** increase or decrease? $b > 1$	y-int: **-6** increase or decrease? $b < 1$	y-int: **55** increase or decrease? $b < 1$	y-int: **1** increase or decrease? $b > 1$

Find each of the following:

9) 15% of 780	10) 3.2% of 360	11) $2\frac{3}{4}$% of $1100
$.15(780) = $ $\boxed{117}$	$.032(360) = $ $\boxed{11.52}$	2.75% $.0275(1100) = $ $\boxed{30.25}$
12) Increase 350 by 6.5% $100 + 6.5 = 106.5\%$ $1.065(350) = $ $\boxed{372.75}$	**13) Decrease $11,300 by 8%** $100 - 8\% = 92\%$ $.92(11300) = $ $\boxed{\$10,396}$	**14) Increase 1,368 by $2\frac{1}{2}$%** $100 + 2.5\% = 102.5\%$ $1.025(1368) = $ $\boxed{1402.2}$

Determine if the table represents a linear or exponential function. Then, write its equation.

15)

x	0	1	2	3	4	5
y	-7	-4	-1	2	5	8

-3   +3   +3   +3   +3   +3

Type: **Linear** $y = mx + b$

Equation: **$y = 3x - 7$**

16)

x	-1	0	1	2	3
y	72	36	18	9	4.5

÷2   ÷2   ÷2   ÷2   → $\times \frac{1}{2}$

Type: **Exponential**

Equation: $y = a(b)^x \Rightarrow$ **$y = 36\left(\frac{1}{2}\right)^x$**

17) Your savings account earns interest at a rate of 2.3% per year and starts with a balance of $225.

.023

a) Write an exponential equation that would give the account's worth, Y, as a function of the number of years, x, it has been gaining interest.

$$y = 225(1 + .023)^x$$

b) Using your equation determine how much money you would have after 4 years?

$$y = 225(1 + .023)^4 = 246.425 \rightarrow \boxed{\$246.43}$$

18) Amy's bill at Applebee's cost $57. What is the total price of Amy's bill if she leaves an 18% tip on the meal?

$$57(1 + .18) = \boxed{\$67.26}$$

19) A 180°F cup of tea is cooling down such that its temperature is decreasing at a constant rate of 5% per minute. Determine the temperature of the cup of tea, to the nearest degree, after 6 minutes.

$$y = 180(100 - .05)^t$$

$$y = 180(.95)^6 = 132.31 \rightarrow \boxed{132°}$$

20) Consider the following exponential function: $f(x) = 2\left(\frac{1}{2}\right)^x$

a) Evaluate each of the following:

$f(-3) = 16$ $(-3, 16)$
$f(-2) = 8$ $(-2, 8)$
$f(-1) = 4$
$f(0) = 2$

$f(1) = 1$
$f(2) = \frac{1}{2} = .5$
$f(3) = \frac{1}{4} = .25$

b) Graph this function for the domain interval $-3 \le x \le 3$

$f(x) = 2\left(\frac{1}{2}\right)^x$