MBF 3C1 Name: _____

UNIT 3 SURVIVAL GUIDE: Exponential Relations

EXPONENT LAWS

Multiplication Law	like bases being multiplied, _____ exponents	$(3^2)(3^4) =$
Division Law	like bases being divided, _____ exponents	$3^6 \div 3^2 =$
Power of a Power Law	power raised to an exponent, _____ exponents	$(3^2)^5 =$
Zero Law	anything raised to the exponent zero equals _____	$3^0 =$
Negative Exponent Law	flip the base to it's _____ and change the exponent to it's _____	$(3^2)(3^{-4}) =$

Power of a Product/Quotient → distribute the exponent to each base

$(3x^2)^3 =$ $\left(\frac{x^2}{3}\right)^3 =$

CHARACTERISTICS OF EXPONENTIAL RELATIONS

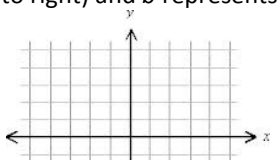
- an exponential **equation** is in the form _____, where a = _____
  b = _____
- the **table of values** of an exponential relation has a _____ which can be determined by dividing consecutive y-values ($y_2 \div y_1$, $y_3 \div y_2$, $y_4 \div y_3$, etc.)

x	y	CR
0	1	$2 \div 1 = 2$
1	2	$4 \div 2 = 2$
2	4	$8 \div 4 = 2$
3	8	$16 \div 8 = 2$
4	16	

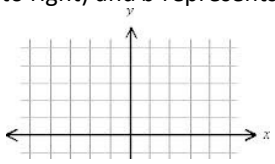
- the **graph** of an exponential relation is nearly _____ at one end and either increases/decreases _____ at the other

EXPONENTIAL RELATIONSHIPS

- exponential **growth** occurs when the relationship is _____ (up to right) and b represents the _____



- exponential **decay** occurs when the relationship is _____ (down to right) and b represents the _____



- exponential relations do not have x-intercepts because exponential relations will _____
- to find the y-intercept, let _____ and solve for y

SOLVING PROBLEMS WITH EXPONENTIAL RELATIONS

1. start with the generalization for exponential relations (_____)
2. sub in the _____ (a)
3. sub in the _____ (b)
   - ★ for *double* use _____, for *half-life* use _____, for *triple* use _____, etc
   - ★ for % growth rate, _____
   - ★ for % decay rate, _____

Example: A principal of $100 is invested at 12% per year, compounded annually.

a. Write an exponential equation to represent the relationship.

$y = ab^x$

$y =$

b. What will the investment be worth in 25 years?