

## Unit 6 Review

Date \_\_\_\_\_

- 1) When you are simplifying exponents using the EXPONENT LAWS, remember the order that you need to follow: Please Make Delicious Ziti Now.

Which law does each letter stand for AND write the law's general form:

P -

M -

D -

Z -

N -

**Simplify. Your answer should contain only positive exponents.**

$$2) \frac{x^2 y^2}{2x^{-3} y^{-3} \cdot 3x^2 y^2}$$

$$3) \frac{2a^2 b^{-3} \cdot 3ba^{-3}}{3a^{-3}}$$

$$4) \frac{2u^2 v^4}{(u^{-2} v^{-4})^3}$$

$$5) \frac{m^{-3} n^{-1}}{(2m^3 n^3)^4}$$

$$6) \frac{2xy}{2x^{-4} y^0 \cdot (xy^0)^0}$$

$$7) \frac{(2x^3)^3 \cdot (2x^2 y^4)^{-3}}{2x^0 y^{-2}}$$

8) Write the exponential growth & decay function and explain what each variable represents.

- 9) What form is the rate always written out in?
- 10) When would you use + and when would you use -?
- 11) If the number of rabbits increases at a rate of 7.5% per month and you want to see how many rabbits there will be after 2 years, then what value will you use for the time?
- 12) If the formula is  $f(4) = 5100 \cdot 0.87^4$ , then what is the percent change?
- 13) The duck population in Central Park increases by 12% each year. There are 1,780 ducks in the park right now. How many ducks will there be in 3 years?
- 14) Mister Mack won the lottery! He is going to invest \$10,000 dollars into a stock that gains 3 % interest every month. How much money will he have in 12 months?
- 15) The Bumble Bee population in North Dakota decreases at a rate of 32% a week in the fall. If there are 8,200 bees at the end of August how many will there be at the end of November (12 weeks later)?
- 16) Sally bought a brand new Mac computer. She paid \$2,800 for it. The computer depreciates at a rate of 11% a month. How much will the computer be worth in a year?

17) Identify each of the following as exponential growth or decay

a.  $y=4,000(1.27)^4$  \_\_\_\_\_

b.  $y=15(1 + 0.3)^{10}$  \_\_\_\_\_

c.  $y=525(0.99)^{119}$  \_\_\_\_\_

d.  $y=1,587(1 - 0.61)^4$  \_\_\_\_\_

e.  $y=8,295(0.3)^{12}$  \_\_\_\_\_

f.  $y=2(1.01)^{100}$  \_\_\_\_\_

g.  $y=431(.14)^3$  \_\_\_\_\_

h.  $y=9,152(1 + 0.2)^{21}$  \_\_\_\_\_

i.  $y=72(0.81)^{19}$  \_\_\_\_\_

18) Provide a definition for what it means to SIMPLIFY A RADICAL. Please remember to include the two aspects that we extensively discussed in class.

19) Write the rules for combining radicals using each operation.

Addition & Subtraction -

Multiplication -

Division -

**Simplify.**

$$20) 3\sqrt{5} + 2\sqrt{45}$$

$$21) 3\sqrt{45} + 3\sqrt{20}$$

$$22) \sqrt{2} \cdot 3\sqrt{20}$$

$$23) -5\sqrt{3}(\sqrt{10} - 4\sqrt{3})$$

$$24) \frac{2\sqrt{3}}{\sqrt{2}}$$

$$25) \frac{\sqrt{10}}{3\sqrt{6}}$$

$$26) \sqrt{28x^4}$$

$$27) \sqrt{128r^3}$$

$$28) 5\sqrt{200r^3}$$

$$29) -5\sqrt{50n^3}$$

**Challenge: Simplify.**

$$30) \frac{4 + \sqrt{2}}{\sqrt{8}}$$

$$31) \frac{\sqrt{5} - 3}{5\sqrt{8}}$$