

## Unit 8 Test - Exponents

Date \_\_\_\_\_

Period 9

Simplify. Your answer should contain only positive exponents.

-1)  $4p^3 \cdot 2p^2 = 8p^5$

-2)  $4a^2b^2 \cdot 4ba^4 = 16ba^6$

1)  $(4x^2)^3 = 64x^6$

4)  $(3a^3b^3)^3 = 27a^9b^9 = 27ab^{18}$   
good

-2)  $\frac{3x^2}{2x^3} = \frac{1}{x}$

-3)  $\frac{2x}{2xy} = \frac{1}{y}$

-1)  $(2b^3)^2 \cdot 2b^2 = 4b^6 \cdot 2b^2 = 8b^8$

-4)  $(2xy^3 \cdot xy^4)^3 = 2^3 x^3 y^{21} = 8x^3 y^{21}$

-2)  $\frac{2p^2 \cdot 3p^3}{4p} = \frac{6p^5}{4p} = \frac{3p^4}{2}$

-3)  $\frac{4x^2y^4}{3x^4y^3} = \frac{1}{3} x^{-2} y^1 = \frac{y}{3x^2}$

211)  $\left(\frac{2r^2}{r}\right)^4 = 2^4 r^8 = 16r^8$

12)  $\frac{2yx^2}{(2x^2y^4)^2} = \frac{2yx^2}{4x^4y^8} = \frac{1}{2}xy^{-6}$

13)  $2x^4y^3 \cdot 3x^{-3}y^3 = 6xy^6$

14)  $\frac{x^{-2}y^3}{x^{-4}y^4} = \frac{xy^1}{xy^1} = 1$

15)  $(2a^4b^{-3})^4 = 16a^{16}b^{-12}$

16)  $x^3 \cdot (x^{-1})^{-2} = x^3 \cdot x^2 = x^5$

17)  $\frac{(r^4)^2}{(r^3)^3} = \frac{r^8}{r^9} = r^{-1} = \frac{1}{r}$

18)  $\frac{3y^3 \cdot xy^{-3}}{3xy^{-2}} = \frac{3xy^0}{3xy^{-2}} = x^0y^2 = y^2$

19) In 1995, you bought a baseball card for \$50, that you expect to increase in value 5% each year for the next 10 years. Write an exponential growth model and estimate the value of the baseball card in 2002. Hint:  $A = P(1+r)^t$

Exponential growth model:  $A = 50(1.05)^{10}$

Value in 2002 (round to the nearest dollar): 2883.5

59.05

$y = 50$

$1 + r = 1.05$

$r = 0.05$   
5%

$\frac{15}{32}$

- 20) Each year the local country club sponsors a tennis tournament. Play starts with 128 participants. During each round, half of the players are eliminated.

$$(A = P(1-r)^t)$$

Exponential Model:

Decay -  $A = 128(1 - \frac{64}{100})^s$

How many players remain after 5 rounds?

$$A = 128(1 - 0.64)^5 = 10$$

$$A = 0.773$$

Consider the equation to answer the following questions.

21)  $y = 2000 \cdot 1.07^t$

a) Circle the initial amount. 2000

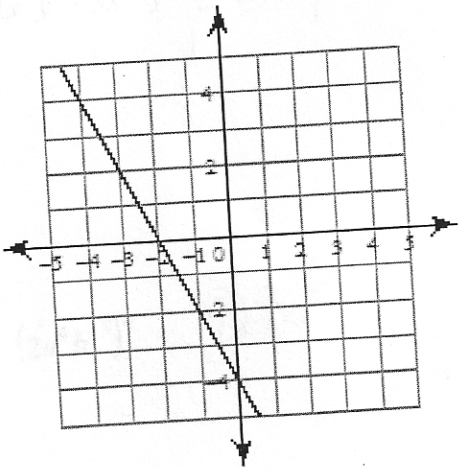
b) Does this model represent exponential growth or decay? growth

c) What is the growth/decay rate? 2140

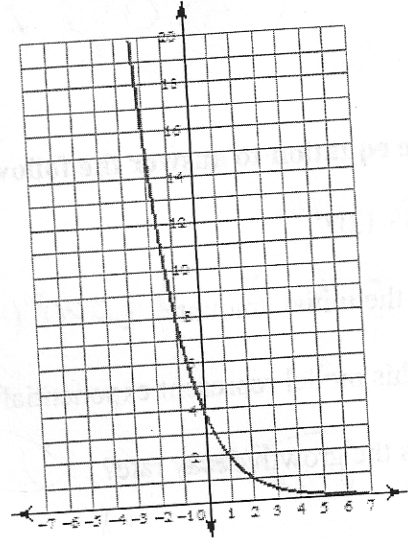
$$= 2 \frac{6}{8}$$

22) Label the following graphs as linear growth, linear decay, exponential growth, or exponential decay.

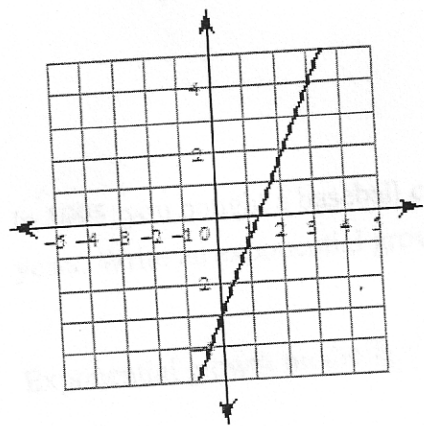
1 a) Decay



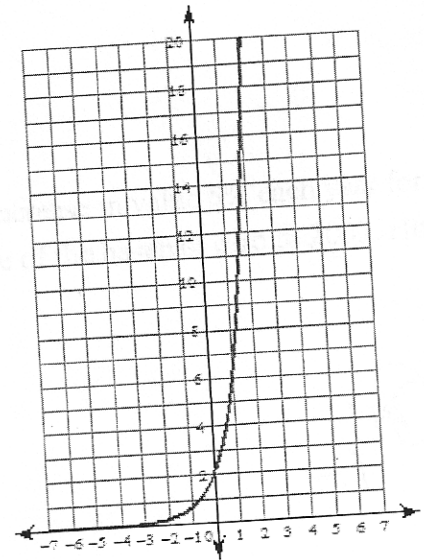
-1 b) Decay



-1 c) Growth



-1 d) Growth



- a  $\frac{6}{10}$