Name:	Keu	- 1	
UNIT 5			

Date:		
LESS	on 9	

Do Now:

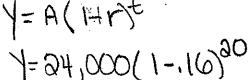
a. For each of the following exponential functions below, determine if it is a growth or decay model. Explain.

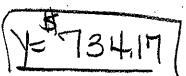
$$growth$$

$$h(x) = 20(.25)^{x}$$

 $decay$

b. You buy a new car for \$24,000. The value of the car decreases by 16% each year. Guess how much the car will be worth in 20 years from now?





AIM: SOLVING EXPONENTIAL WORD PROBLEMS

The "YART" Formula for Exponential GROWTH

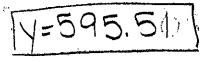
Y = final amount

A = initial amount

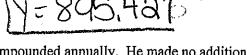
r = rate as a decimal.

t= time

- 1. Jack has \$500 to invest. The bank offers an interest rate of 6% compounded annually.
 - a. How much money will Jack have after three years?



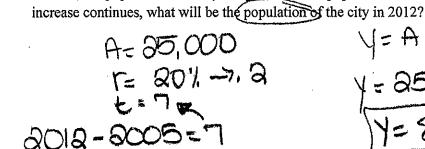
b. What about after ten years?

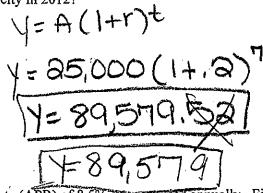


2. Mr. Smith invested \$2,500 in a savings account that earns 3% interest compounded annually. He made no additional deposits or withdrawals. Which expression can be used to determine the number of dollars in this account at the end of 4 years?

3)
$$2500(1+0.04)^3$$

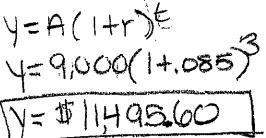
4)
$$2500(1+0.4)^3$$



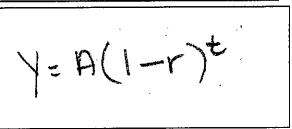


4. A sum of \$9,000 is invested at an annual percentage rate (APR) of 8.5% compounded annually. Find the balance in the account after 3 years. Round to the nearest dollar.

3. In 2005, the population of a city was 25.000. The population increased by 20% in the following year. If this rate of



The "YART" Formula for Exponential DECAY



5. You purchase an I-Pod for \$70. After you take it home from the store, the value of the I-Pod decreases 3% each year. What is the value of the I-Pod after 2 years? Round to the nearest cent.

$$\begin{array}{ll}
A = 70 \\
r = .03 \\
t = 2
\end{array}$$

$$\begin{array}{ll}
Y = A(1-r)^{t} \\
Y = 70(1-.03)^{2} \\
Y = 65.86
\end{array}$$

6. Is the equation $A = 21000(1 - 0.12)^{2}$ a model of exponential growth or exponential decay, and what is the rate (percent) of change per time period?

exponential growth and 12%

1-,010= .88 -788%

- 3) exponential decay and 12%
- 4) exponential decay and 88%

PARTNER PTRACTICE:

7. Raymond buys a new car for \$21, 500. The car depreciates by about 11% per year. What is the value of the car after 5 years? Round to the *nearest dollar*.

$$A=21,500$$
 $Y=A(1+r)^{\pm}$
 $Y=01,500(1-.11)^{5}$
 $Y=01,500(1-.11)^{5}$
 $Y=01,500(1-.11)^{5}$

8. Kirsten invested \$1000 in an account at an annual interest rate of 3%. She made no deposits or withdrawals on the account for 5 years. The interest was compounded annually. Find the balance in the account, to the nearest cent, at the end of 5 years.

9. A student invests \$500 for 3 years in a savings account that earns 4% interest per year. No further deposits or withdrawals are made during this time. Which statement does not yield the correct balance in the account at the end of 3 years?

$$\frac{41.500(1.04)^3}{(2).500(1-.04)^3} decoy$$

10. Daniel's Print Shop purchased a new printer for \$35,000. Each year it depreciates at a rate of 5%. What will its value be at the end of the fourth year?

$$Y=A(1-r)^{t}$$

 $Y=35,000(1-.05)^{t}$
 $Y=38,507.72$

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