

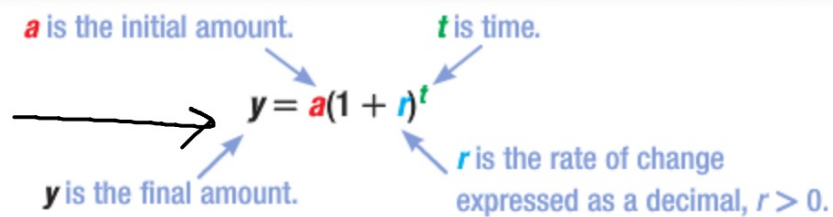
Algebra 1      7.6      ( + )  
Solve problems involving exponential growth  
Solve problems involving exponential decay  
exponent      ( - )  
base  
whiteboards

$$\left(1 + \frac{r}{n}\right)^{nt}$$

Quiz tomorrow 7.5-7.6

**1 Exponential Growth** The equation for the number of blogs is in the form  $y = a(1 + r)^t$ . This is the general equation for exponential growth.

 **Key Concept** Equation for Exponential Growth



$y = a(1 + r)^t$

$a$  is the initial amount.

$t$  is time.

$y$  is the final amount.

$r$  is the rate of change expressed as a decimal,  $r > 0$ .

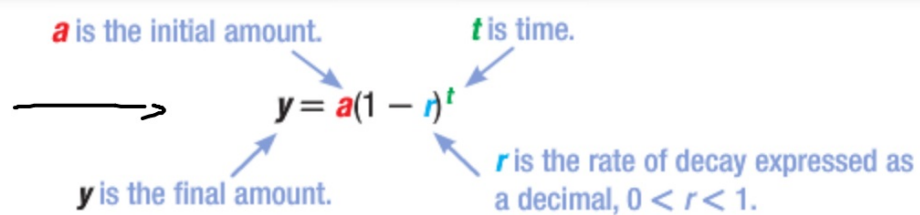
### KeyConcept Equation for Exponential Decay

$a$  is the initial amount.

$t$  is time.

$y$  is the final amount.

$r$  is the rate of decay expressed as a decimal,  $0 < r < 1$ .

$$y = a(1 - r)^t$$


How are they the same? How are they different?

**Compound interest** is interest earned or paid on both the initial investment and previously earned interest. It is an application of exponential growth.

### KeyConcept Equation for Compound Interest

$A$  is the current amount.

$$A = P \left( 1 + \frac{r}{n} \right)^{nt}$$

$n$  is the number of times the interest is compounded each year, and  $t$  is time in years.

$P$  is the principal or initial amount.

$r$  is the annual interest rate expressed as a decimal,  $r > 0$ .

## Whiteboards

1. **SALARY** Ms. Acosta received a job as a teacher with a starting salary of \$34,000. According to her contract, she will receive a 1.5% increase in her salary every year. How much will Ms. Acosta earn in 7 years?

$$= 34000 \left( 1 + 0.015 \right)^7$$

$$= 34000 (1.015)$$

$$= \$37734.73$$

3. **ENROLLMENT** In 2000, 2200 students attended Polaris High School. The enrollment has been declining 2% annually.

a. Write an equation for the enrollment of Polaris High School  $t$  years after 2000.

b. If this trend continues, how many students will be enrolled in 2015?

$$a) \quad y = 2200(1 - 0.02)^t$$

$$b) \quad = 2200(1 - 0.02)^{15}$$
$$= 2200(0.98)^{15}$$
$$= 1624.852026$$

$\approx 1625$  students

6. **COINS** Camilo purchased a rare coin from a dealer for \$300. The value of the coin increases 5% each year. Determine the value of the coin in 5 years.

\$ 382.88

10. **INVESTMENTS** Jin's investment of \$4500 has been losing its value at a rate of 2.5% each year. What will his investment be worth in 5 years?

\$ 3964.93



8000 monthly  
35 yr

\$ 35,315.21

\$ 34,929.35

4.25%