# Algebra 8-2: Exponential Growth

## Warm-Up

$T = P(1+i)^n$

1. You earned $200 this summer and put it in a savings account.

   1. How much is the investment worth in 10 years if it earns .25% annual yield? $205.05

   $T = 200(1+.0025)^{10} = 200(1.0025)^{10}$

   2. How much interest was earned? $5.05

   205.05
   - 200.00

2. Find the value for each term for x = 1, 2, 3, 4, 5, & 6.

   a. $2^x$ $2^1=2, 2^2=4, 2^3=8, 2^4=16, 2^5=32, 2^6=64$ (×3, ×3, ×3, ×3, ×3, ×3)

   b. $3 \cdot 2^x$ 6, 12, 24, 48, 96, 192

| Vocab | Definition |
| --- | --- |
| Exponential Growth | · original amount repeatedly multiplied by a growth factor<br>· depends on time (seconds, days, weeks, years, etc)<br>· growth factor (g) > 1 |

$y = bg^x$

New amount

Time

10% growth factor

$y = bg^x$ Ex: $200 \cdot (1.1)^3$

amount you start with

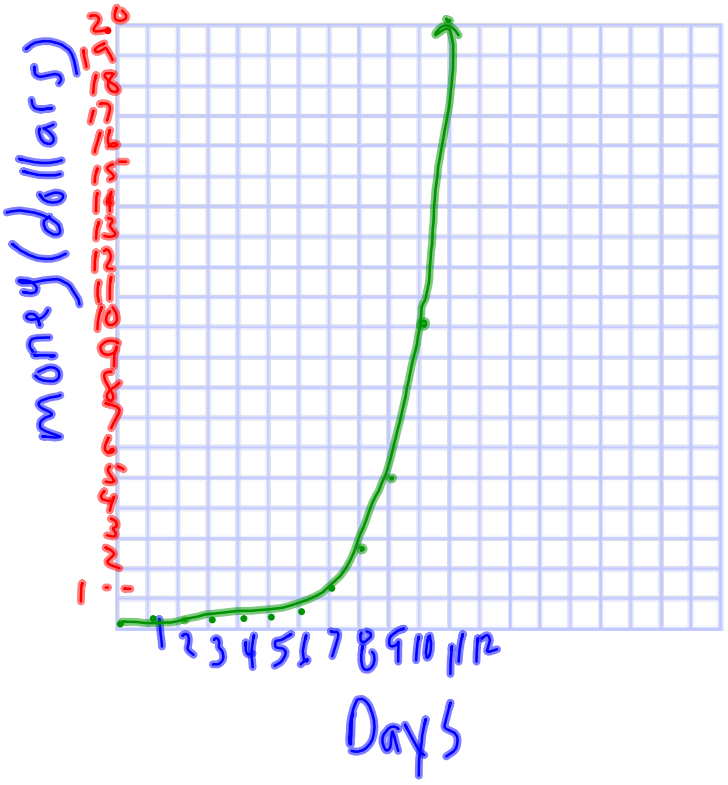
growth factor

original amount

Examples

1. If you start with a penny and double the amount you save each day, how much will you have after 12 days? Draw a graph that represents the situation.

| X Day | Y Money |
|---|---|
| 0 | .01 |
| 1 | .02 |
| 2 | .04 |
| 3 | .08 |
| 4 | .16 |
| 5 | .32 |
| 6 | .64 |
| 7 | 1.28 |
| 8 | 2.56 |
| 9 | 5.12 |
| 10 | 10.24 |
| 11 | 20.48 |
| 12 | 40.96 |



2. Through the 1980's, the population of Central and South America grew at a rate of about 2.1% per year. In 1991 the population was 458 million people. If this growth continues, what will the population of Central and South America be in the year 2000?

$y = bg^x$

$y = 458(1.021)^9$

$y = 552.2$ million people

2000
−1991
9

growth
100 + 2.1%
102.1%
1.021

3. If you save a penny in January and double the amount of savings each month, how much would you save in a year?

$y = bg^x$

$y = (.01)(2)^{12} = \$40.96$