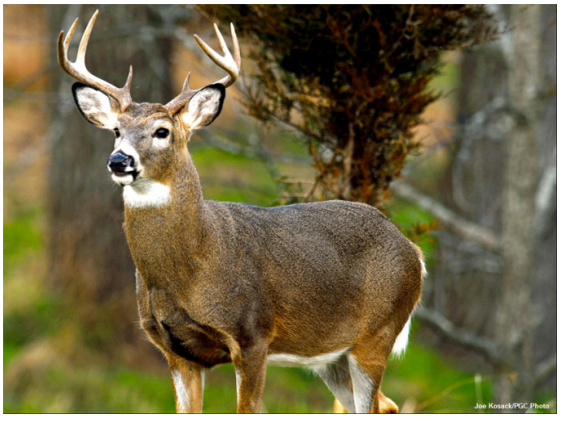
Warm Up

12/17

The white tailed deer population in Massachusetts is estimated to be 105,000 deer. If the population is growing at a rate of 7%, how many deer will there be in 10 years?



$y = 105{,}000(1.07)^{10}$

$= 206{,}551$ deer

Problem 3.3

Mrs. Ramos started college funds for her two granddaughters. She gave $1,250 to Cassie and $2,500 to Kaylee. Mrs. Ramos invested each fund in a 10-year bond that pays 4% interest a year.

= GF: 1.04

A 1. Write an equation to show the relationship between the number of years and the amount of money in each fund.

2. Make a table to show the amount in each fund for 0 to 10 years.

3. Compare the graphs of each equation you wrote in part (1).
You can use Desmos and make a sketch of what they would look like.

4. **a.** How does the initial value of the fund affect the yearly value increases? Kaylee's yearly ↑ will be 2x Cassie's

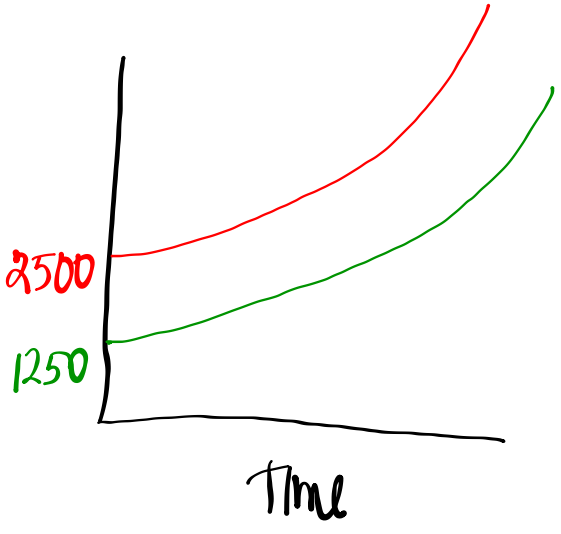
b. How does the initial value affect the growth factor? no effect

c. How does the initial value affect the final value?

If initial value is 2x, final value will be 2x

Cassie $y = 1250(1.04)^x$ Kaylee $y = 2500(1.04)^x$

After 10 yrs. $1850.31 $3700.61



B A year later, Mrs. Ramos started a fund for Cassie's cousin, Matt. Cassie made this calculation to predict the value of Matt's fund several years from now:

$$\text{Value} = \$2{,}000 \times 1.05 \times 1.05 \times 1.05 \times 1.05$$

1. What initial value, growth rate, growth factor, and number of years is Cassie assuming?

5% 1.05 4 years

2. If the value continues to increase at this rate, how much would the fund be worth in one more year?

Multiply by another 1.05

$2552.56

$2000 initial value

C Cassie's and Kaylee's other grandmother offers them a choice between college fund options.

Option 1	OR	Option 2
$1,000 at 3% interest per year		$800 at 6% per year

3% = $30

6% = $48

Which is the better option? Explain your reasoning.

After 5 yrs

$1159.27

$1070.58

After 10 yrs

$1343.92

$1432.68

After 8 years Option 2 is the best.

Classwork

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21. Multiple Choice Ms. Diaz wants to invest $500 in a savings bond. At which bank would her investment grow the most over 8 years?

A. Bank 1: 7% annual interest for 8 years

B. Bank 2: 2% annual interest for the first 4 years and 12% annual interest for the next four years

C. Bank 3: 12% annual interest for the first 4 years and 2% annual interest for the next four years

D. All three result in the same growth.

Work must be shown to support your answer.

22. Oscar made the following calculation to predict the value of his baseball card collection several years from now:

$$\text{Value} = \$130 \times 1.07 \times 1.07 \times 1.07 \times 1.07 \times 1.07$$

a. What initial value, growth rate, growth factor, and number of years is Oscar assuming?

b. If the value continues to increase at this rate, how much would the collection be worth in three more years?

23. Carlos, Latanya, and Mila work in a biology laboratory. Each of them is responsible for a population of mice.

The growth factor for Carlos's population of mice is $\frac{3}{8}$.	The growth factor for Latanya's population of mice is 3.	The growth ~~factor~~ rate for Mila's population of mice is 125%.

a. Whose mice are reproducing fastest?

b. Whose mice are reproducing slowest?

34. Kwan cuts lawns every summer to make money. One customer offers to give her a 3% raise next summer and a 4% raise the summer after that.

Kwan says she would prefer to get a 4% raise next summer and a 3% raise the summer after that. She claims she will earn more money this way. Is she correct? Explain.

35. After graduating from high school, Kim accepts a job with a package delivery service, earning $\$9$ per hour.

a. How much will Kim earn in a year if she works 40 hours per week for 50 weeks and gets 2 weeks of paid vacation time?

b. Write an equation showing the relationship between the number of weeks Kim works w and the amount she earns a.

c. Kim writes the following equation: $9{,}000 = 360w$. What question is she trying to answer? What is the answer to that question?

d. Suppose Kim works for the company for 10 years, receiving a 3% raise each year. Make a table showing how her annual income grows over this time period.

e. When Kim was hired, her manager told her that instead of a 3% annual raise, she could choose to receive a $\$600$ raise each year. How do the two raise plans compare over a 10-year period? Which plan do you think is better? Explain your answer.

36. Which represents faster growth, a growth factor of 2.5 or a growth rate of 25%?

37. Order these scale factors from least to greatest.

130% $\frac{3}{2}$ 2 1.475

Homework

Finish classwork