

Answer Key

Worksheet 3: Percent Increases

When we increase a quantity by a percent of the quantity, we are starting with 100% of the quantity.

Example 1: Increasing a quantity by 5% is the same as taking $100\% + 5\% = 105\%$ of the quantity

Example 2: Increasing a quantity by 35% is the same as taking $100\% + 35\% = 135\%$ of the quantity

Increasing a quantity by $N\%$ is the same as taking $(100 + N)\%$ of the quantity

Directions: Answer each of the following questions. Show all work for full credit.

1. You invest \$1,000 with interest rate of 7% annually. How much will you have after one year? *Another way of asking this: What's 7% more than \$1000?*

$$1000 \times 1.07 = 1070$$

2. What's 14% more than \$45?

$$1.14 \times 45 = 51.30$$

3. Asia opens a bank account that earns 1.2% interest each year. She deposits \$5,000. What number can you multiply \$5,000 by to calculate how much money she will have after one year?

$$1.012$$

4. Alysia recently put all her money into an investment for one year. At the end of that year she had 113% of the amount she initially deposited. What was the annual interest rate of her investment?

$$13\%$$

5. Tamika invested \$5,000. When she withdrew her money, the investment was worth \$6,150.
 - a. By what percent did her investment increase?

$$6150 - 5000 = 1150 \rightarrow 1150/5000 = 0.23$$

- b. Assuming she invested for one year, what was her interest rate?

$$23\%$$

6. John borrowed \$859 from his good friend Susan to buy a suit for the first day at his new job. Susan agreed to lend the money if he paid her back 30% more than she lent him. **

a. In dollars, how much does John owe Susan?

$$859 \times 1.3 = 1116.70$$

b. What percent of the original amount borrowed does John owe Susan?

130%

7. Nora was shopping for investment opportunities and found one advertising that if you invest with them for one year, you will increase your money by 30%. **

a. What is the interest rate for this investment opportunity?

30%

b. How much money will Nora earn if she invests \$4500?

$$4500 \times 1.3 = 5850$$

8. Charlie is confused. In #6, 30% represented one number and in #7, 30% represented a different number. Does this mean he made a mistake? Shouldn't 30% always equal 30%?

No, because 30% of two different numbers will represent two different quantities. The value of 30% is relative to what we are considering to represent the 100%. In #6 859 represented 100% and in #7 4500 represented 100%

***Note: It is important to tell students that a 30 percent increase in one year on any investment is very unlikely. Explain that it is being used ONLY to illustrate a large gain but is not a realistic expectation. In fact, they might want to beware of a scam or fraud that would promise them an excessive return on their investment.*