

Answer Key - Worksheet 5: Percent Increase/Decrease Problem Set

Directions: Provide a solution to each of the following questions. Show all work for full credit.

1. Math-O's cereal has just redesigned their box. The front of the box includes a statement that the new box contains 30% more cereal. The back of the box includes a statement that the new box contains 130% of contents of the old box. Is it possible that both statements are true or must one of them be false?

These two claims are both saying the same thing. When you increase a quantity by 30% you have 130% of the original quantity.

2. Ellen's Erasers is revolutionizing the eraser business. They claim that their erasers can erase 150% more than their competitors. What does that mean? If a normal eraser can erase approximately 1,569 characters how many characters can one of Ellen's Erasers erase?

$$1569 \times 1.50 = 2353.5$$

3. Carlos the Curious took out a loan of \$1,000 for one month. He always pays back his loans in \$1 bills. At the end of the month, when it comes time to pay, he lays out one thousand \$1 bills on the table. He arranges them into ten equal piles, with one hundred \$1 bills in each pile and he proclaims, "This is my principal." He then proceeds to add five \$1 bills to each pile, then says "and this is my interest."

- a. How many dollars did he *add* to each pile?

He added 5 \$1 bills to each pile

- b. How many total dollars did he *add* (adding up the number he added to each pile)?

He added $10 \times 5 = 50$ \$1 bills because there are ten piles

- c. What was the percent increase in each pile when he adds the 5 bills?

He increased each pile by 5% because each pile goes from 100 bills to 105 bills

- d. What percent of the original total number of bills in all piles does the total number of added bills represent?

He finished with 1050 bills and he started with 1000 bills, therefore the added bills increased the total by 5%

- e. What was the interest rate on his loan?

His interest rate was 5%



4. You put money into an investment for one year:

- a. What would the annual interest rate need to be so that you double your money?

100%

- b. What would the annual interest rate need to be so that you triple your money?

200%

- c. What would the annual interest rate need to be so that you earn twice your principal in interest?

200%

- d. What would the annual interest rate need to be if you want to earn half of your principal in interest?

50%

- e. Which two questions in 4a-d have the same answer? Explain why.

Questions b & c have the same answer. When you “triple” your money, you increase it by 300%. But, when you earn twice your money, you increase your principal by 200%. A 200% increase means $100 + 200 = 300$, 300% of your principal.

5. A store has two concurrent sales that you can combine. The price of every item in the store is being decreased by 50% and there is an additional 50% off anything marked as a clearance item. Does that mean clearance items are free? Explain.

No, it does not mean the items are free. If you take 50% of 50%, it is 25%. Thus, every item in the store will be reduced to 25% of its original price which is a 75% off discount.