

Writing Equations

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CONCEPT 1

Writing Equations

Suppose there is a concession stand selling burgers and French fries. Each burger costs \$2.50 and each order of French fries costs \$1.75. You and your family will spend exactly \$25.00 on food. How many burgers can be purchased? How many orders of fries? How many of each type can be purchased if your family plans to buy a combination of burgers and fries?



The underlined word exactly lends a clue to the type of mathematical sentence you will need to write to model this situation.

These words can be used to symbolize the equal sign:

Exactly, equivalent, the same as, identical, is

The word *exactly* is synonymous with equal, so this word is directing us to write an equation. Using the methods previously learned, read every word in the sentence and translate each into mathematical symbols.

Example 1: Your family is planning to only purchase burgers. How many can be purchased with \$25.00?

Solution:

Step 1: Choose a variable to represent the unknown quantity, say b for burgers

Step 2: Write an equation to represent the situation: $2.50b = 25.00$

Step 3: Think. What number multiplied by 2.50 equals 25.00

The solution is 10, so your family can purchase exactly ten burgers.

Example 2: Translate the following into equations:

- 9 less than twice a number is 33.
- Five more than four times a number is 21.
- \$20.00 was one-quarter of the money spent on pizza.

Solutions:

a) Let a number be n . So, twice a number is $2n$.

Nine less than that is $2n - 9$.

The word *is* means the equal sign, so $2n - 9 = 33$

b) Let a number be x . So five more than four times a number is 21 can be written as: $4x + 5 = 21$

c) Let of the money be m . The equation could be written as $\frac{1}{4}m = 20.00$

Practice Set

Define the variables and translate the following statements into algebraic equations.

1. Peters Lawn Mowing Service charges \$10 per job and \$0.20 per square yard. Peter earns \$25 for a job.
2. Renting the ice-skating rink for a birthday party costs \$200 plus \$4 per person. The rental costs \$324 in total.
3. Renting a car costs \$55 per day plus \$0.45 per mile. The cost of the rental is \$100.
4. Nadia gave Peter 4 more blocks than he already had. He already had 7 blocks.
5. An amount of money is invested at 5% annual interest. The interest earned at the end of the year is equal to \$250.
6. You buy hamburgers at a fast food restaurant. A hamburger costs \$0.49. You have at \$3 to spend. Write an equation for the number of hamburgers you can buy.