

4-6 Study Guide and Intervention

Writing Equations

Write Two-Step Equations Just as phrases can be represented as expressions, sentences can be represented as equations.

Phrase: two more than three times a number

Expression: $2 + 3n$

Sentence: Two more than three times a number is 11.

Equation: $2 + 3n = 11$

Example

Clint has 95 trading cards. This is 17 more than three times the number of cards his brother Wyatt has.

Words	Three times Wyatt's cards + 17 = Clint's cards.
Symbols	Let w = Wyatt's cards.
Equation	$3w + 17 = 95$

Exercises

Translate each sentence into an equation.

- Nine more than half of a number is 21.
- Six fewer than $\frac{1}{3}$ of a number is 27.
- Eleven more than three times a number is 101.
- The quotient of a number and four decreased by 2 is 6.
- Julie has 66 stuffed animals which is 8 fewer than twice the number of stuffed animals that Carly has.
- The \$22 Mara spent at a museum gift shop was \$4 more than twice the admission to the museum.
- A hamburger costs \$7 which is \$2 more than one-third the cost of a pizza.
- Riley lives 62 miles from his grandma's house which is 22 miles farther than one-quarter the distance to his aunt's house.
- Angie is 11, which is 3 years younger than 4 times her sister's age.
- A puppy weighs 14 pounds which is 6 more than one-fifth the mother dog's weight.

4-6 Study Guide and Intervention *(continued)***Writing Equations**

Two-Step Verbal Problems Some real-world situations involve a given amount which then increases or decreases at a certain rate. Such a situation can be represented by a two-step equation.

Example **PRINTING** A laser printer prints 9 pages per minute. Liza refilled the paper tray after it had printed 92 pages. In how many more minutes will there be a total of 245 pages printed?

Understand You know the number of pages printed and the total number of pages to be printed. You need to find the number of minutes required to print the remaining pages.

Plan Let m = the number of minutes. Write and solve an equation. The remaining pages to print is $9m$.

remaining pages + pages printed = total pages

$$9m + 92 = 245$$

Solve $9m + 92 = 245$ Write the equation.

$$9m + 92 - 92 = 245 - 92$$
 Subtraction Property of Equality

$$9m = 153$$
 Simplify.

$$m = 17$$
 Division Property of Equality

Check The remaining 153 pages will print in 17 minutes. Since $245 - 153 = 92$, the answer is correct.

Exercises

Solve each problem by writing and solving an equation.

- METEOROLOGY** During one day in 1918, the temperature in Granville, North Dakota, began at -33° and rose for 12 hours. The high temperature was about 51° . About how many degrees per hour did the temperature rise?
- SAVINGS** John has \$825 in his savings account. He has decided to deposit \$65 per month until he has a total of \$1800. In how many months will this occur?
- SKYDIVING** A skydiver jumps from an airplane at an altitude of 12,000 feet. After 42 seconds, she reaches 4608 feet and opens her parachute. What was her average velocity during her descent?
- FLOODING** The water level of a creek has risen 4 inches above its flood stage. If it continues to rise steadily at 2 inches per hour, how long will it take for the creek to be 12 inches above its flood stage?
- AGES** Maya's brother was 12 when she was born. The sum of their ages is 22. Find their ages.