

3-1 Writing Equations (Pages 120–126)

You can use a four-step plan to solve problems.

Problem-Solving Plan	<ol style="list-style-type: none"> 1. Explore the problem. 2. Plan the solution. 3. Solve the problem. 4. Examine the solution.
Writing an Equation	<p>Many verbal sentences that express numerical relationships can be written as equations. Define a variable to represent one of the unspecified numbers or measures referred to in the sentence or problem. Some words that suggest the equals sign are</p> <ul style="list-style-type: none"> • is • is equal to • is as much as • equals • is the same as • is identical to

Examples

Translate each verbal sentence into an equation or inequality.

- a. Juan has 3 more books than Maria, and together they have 15 books.**

Let m = the number of books Maria has.
 $(m + 3) + m = 15$

- b. Twice the sum of the square of a number and 14 is greater than 32.**

Let x = the number.
 $2(x^2 + 14) > 32$

Practice

1. A farmer has a rectangular field that is 200 feet longer than it is wide. The perimeter of the field is 4000 feet.
 - a. If w represents the width of the field, what expression represents the length of the field?
 - b. What expression represents the perimeter of the field?
 - c. What equation expresses the fact that the perimeter is 4000 feet?

Translate each sentence into an equation, inequality, or formula.

2. The product of x and the cube of y is 30.
3. The area of a circle is the product of π and the square of the radius.
4. Two-thirds of the sum of a , the square of b , and c is the same as 45.
5. The sum of m and n is at least twice as large as the difference of m and n .
6. A Kodiak bear begins having 3 cubs every 3 years starting at age 6. If the average lifespan of a Kodiak bear is 29 years, how many cubs does a mother bear average in a lifetime?
7. **Standardized Test Practice** What is the width of a rectangular field that has a perimeter of 4000 feet if the length of the field is 200 feet greater than the width?

- A** 1800 ft **B** 1100 ft **C** 900 ft **D** 800 ft

Answers: 1a. $w + 200$ 1b. $w + (w + 200) + w + (w + 200) + w + 400$ or $4w + 400$ 1c. $4w + 400 = 4000$ 2. $xy^3 = 30$ 3. $A = \pi r^2$ 4. $\frac{2}{3}(a + b^2 + c) = 45$ 5. $m + n \geq 2(m - n)$ 6. 24 cubs 7. C