

VARIABLES A **variable** is a letter that is used to represent one or more numbers. An expression involving variables is called an **algebraic expression**. When you substitute a number for each variable in an algebraic expression and simplify, you are *evaluating* the algebraic expression.

EXAMPLE 2 Evaluate an algebraic expression

Evaluate $-4x^2 - 6x + 11$ when $x = -3$.

$$\begin{aligned} -4x^2 - 6x + 11 &= -4(-3)^2 - 6(-3) + 11 && \text{Substitute } -3 \text{ for } x. \\ &= -4(9) - 6(-3) + 11 && \text{Evaluate power.} \\ &= -36 + 18 + 11 && \text{Multiply.} \\ &= -7 && \text{Add.} \end{aligned}$$

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EXAMPLE 3 Use a verbal model to solve a problem

CRAFT FAIR You are selling homemade candles at a craft fair for \$3 each. You spend \$120 to rent the booth and buy materials for the candles.

- Write an expression that shows your profit from selling c candles.
- Find your profit if you sell 75 candles.

Solution

STEP 1 Write a verbal model. Then write an algebraic expression. Use the fact that profit is the difference between income and expenses.

Price per candle (dollars/candle)	•	Number of candles sold (candles)	–	Expenses (dollars)
↓		↓		↓
3	•	c	–	120

An expression that shows your profit is $3c - 120$.

STEP 2 Evaluate the expression in Step 1 when $c = 75$.

$$\begin{aligned} 3c - 120 &= 3(75) - 120 && \text{Substitute 75 for } c. \\ &= 225 - 120 && \text{Multiply.} \\ &= 105 && \text{Subtract.} \end{aligned}$$

► Your profit is \$105.

✓ GUIDED PRACTICE for Examples 1, 2, and 3

Evaluate the expression.

- 6^3
- -2^6
- $(-2)^6$
- $5x(x - 2)$ when $x = 6$
- $3y^2 - 4y$ when $y = -2$
- $(z + 3)^3$ when $z = 1$
- WHAT IF?** In Example 3, find your profit if you sell 135 candles.