

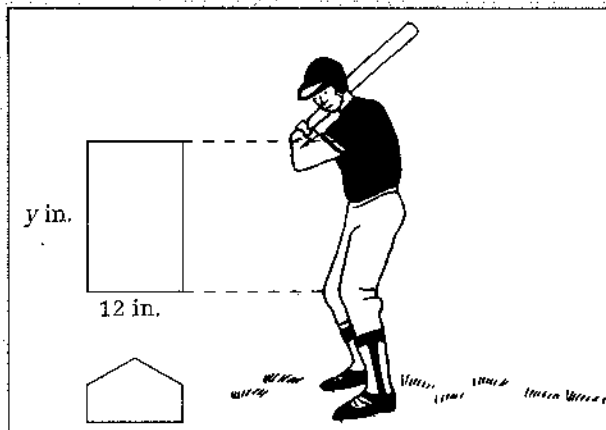
2-6

Expressions for Measures

FOCUS

Simplify expressions for measures of geometric figures by multiplying and combining like terms.

In baseball, the strike zone for a batter is a rectangular region 12 in. wide and y in. high, where y is the distance between the batter's armpits and knees. An expression for the area of the strike zone is $12y$ in.², where the value of y varies according to the batter's height and stance.



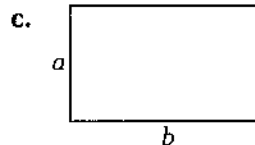
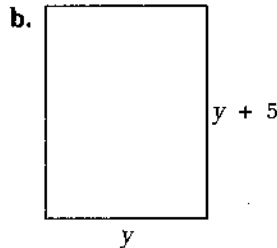
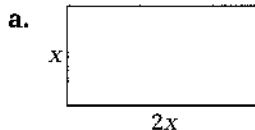
UNDERSTANDING THE MAIN IDEAS

Adding, multiplying, and simplifying variable expressions

Variable expressions can be used to represent the dimensions of geometric figures. In many geometric situations, you need to multiply and/or add these expressions and then simplify the resulting expression by combining like terms.

Sample

Write and simplify an expression for the perimeter and area of each rectangle.



Sample Response

a. Perimeter = $2(x) + 2(2x)$ ← Perimeter = $2l + 2w$
 $= 2x + 4x$
 $= 6x$

Area = $(x)(2x)$ ← Area = $l \cdot w$
 $= 2x^2$

Sample Response continues on the next page.

$$\begin{aligned}
 \text{b. Perimeter} &= 2(y) + 2(y + 5) \\
 &= 2y + 2y + 10 \\
 &= 4y + 10 \quad \leftarrow \text{Combine like terms.} \\
 \text{Area} &= (y)(y + 5) \\
 &= y^2 + 5y \quad \leftarrow \text{Use the distributive property.} \\
 \text{c. Perimeter} &= 2(a) + 2(b) \\
 &= 2a + 2b \\
 \text{Area} &= (a)(b) \\
 &= ab
 \end{aligned}$$

Simplify if possible. If not, explain why not.

1. $(12x)(12x)$
2. $(7m)(15n)$
3. $6c(14c^2)$
4. $5a + 7c + 2a + 5b - 6c$
5. $3x^2 + 2xy + 3y^2$
6. $5ab + 4bc + 6ab - 7bc$
7. $8x^3 - 3y^2 + 2xy + 12y^2$

Review PREVIEW

8. Sketch a 30° angle. Describe how you estimated the size of the angle.
(Section 2-5)

Model each expression using algebra tiles. (Section 1-3)

9. $3x$
10. $5 + x$
11. $4x + 2$