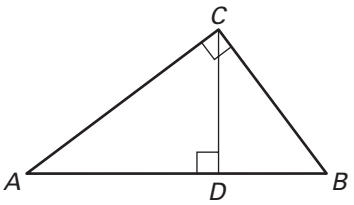
LESSON 12.5

NAME _____ DATE _____

Challenge: Skills and Applications

For use with pages 738–744

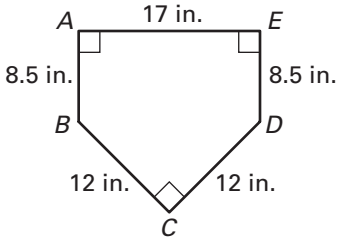
In Exercises 1 and 2, find the value of *x* and the lengths of sides *AB, BC,* and *AC* of triangle *ABC.*



1. $AD = 16$; $CD = 4x$; $DB = 3x$; $AC = 20$
2. $AD = 12x$; $CD = 5x$; $DB = 25$; $BC = 65$

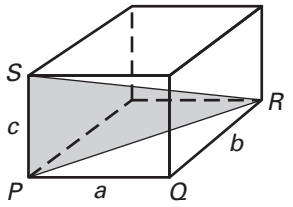
In Exercises 3 and 4, use the following information.

The Official Baseball Rule Book calls for home plate to have the dimensions shown in the diagram at the right, with right angles where they are indicated.



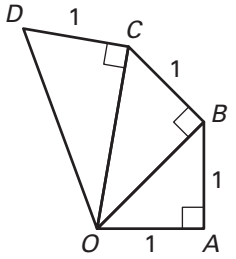
3. Use the Pythagorean Theorem to find *BD*. Give the length to the nearest tenth of an inch and to the nearest hundredth of an inch.
4. What inconsistency do you notice in the Rule Book diagram?

In Exercises 5–7, use the rectangular box with edges of length *a, b,* and *c.*



5. Let d = the length PR. Express d^2 in terms of a, b, and/or c.
6. Let e = the length of the diagonal RS. Express e^2 in terms of d and c.
7. Use the relationships from Exercises 5 and 6 to express e^2 in terms of a, b, and c.

In Exercises 8–10, use the diagram at the right.



8. Find the length OD.
9. Suppose the diagram were continued to include 7 more right triangles, each with the shorter leg of length 1 and with the longer leg coinciding with the hypotenuse of the triangle before it. What would be the length of the longest hypotenuse in the new diagram?
10. Find a formula for the length of the hypotenuse of the nth triangle.