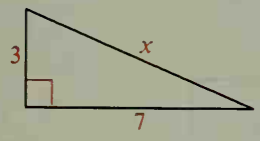
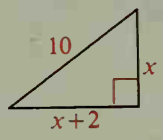
Example Find the value of x. Remember that the length of a segment must be a positive number.

a.



b.



Solution

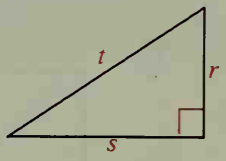
a. $x^2 = 7^2 + 3^2$
$x^2 = 49 + 9$
$x^2 = 58$
$x = \sqrt{58}$

b. $x^2 + (x + 2)^2 = 10^2$
$x^2 + x^2 + 4x + 4 = 100$
$2x^2 + 4x - 96 = 0$
$x^2 + 2x - 48 = 0$
$(x + 8)(x - 6) = 0$
~~$x = -8$~~; $x = 6$

Classroom Exercises

1. The early Greeks thought of the Pythagorean Theorem in this form: *The area of the square on the hypotenuse of a right triangle equals the sum of the areas of the squares on the legs.* Draw a diagram to illustrate that interpretation.

2. Which equations are correct for the right triangle shown?



a. $r^2 = s^2 + t^2$ **b.** $s^2 = r^2 + t^2$ **c.** $s^2 + r^2 = t^2$
d. $s^2 = t^2 - r^2$ **e.** $t = r + s$ **f.** $t^2 = (r + s)^2$

Complete each simplification.

3. $(\sqrt{3})^2 = \sqrt{3} \cdot$? $=$?

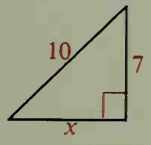
4. $(3\sqrt{11})^2 =$? $\cdot$? $= 9 \cdot$? $=$?

Simplify each expression.

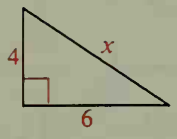
5. $(\sqrt{5})^2$
6. $(2\sqrt{7})^2$
7. $(7\sqrt{2})^2$
8. $(2n)^2$
9. $\left(\frac{3}{\sqrt{5}}\right)^2$
10. $\left(\frac{\sqrt{2}}{2}\right)^2$
11. $\left(\frac{n}{\sqrt{3}}\right)^2$
12. $\left(\frac{2}{3}\sqrt{6}\right)^2$

State an equation you could use to find the value of x. Then find the value of x in simplest radical form.

13.



14.



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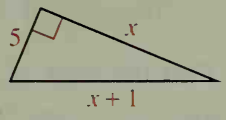

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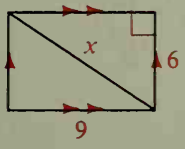

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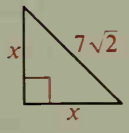

18.