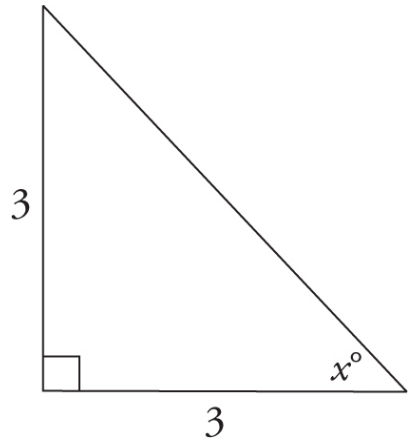
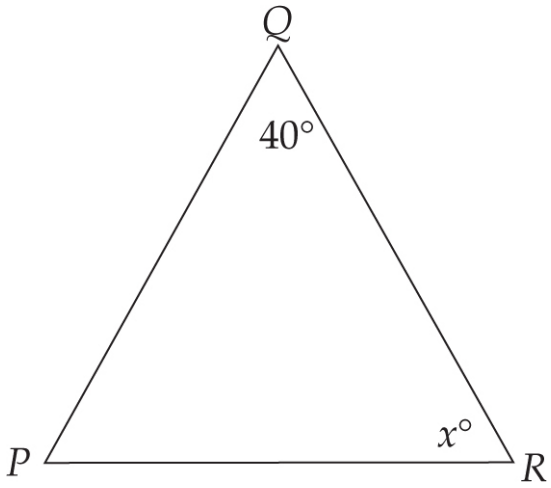
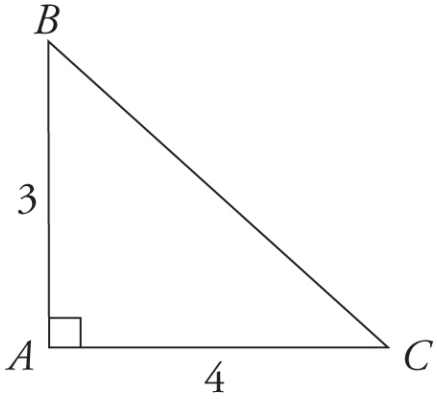
PRACTICE DRILL 26—TRIANGLES (ELEMENTARY, LOWER, MIDDLE, AND UPPER LEVELS ONLY)



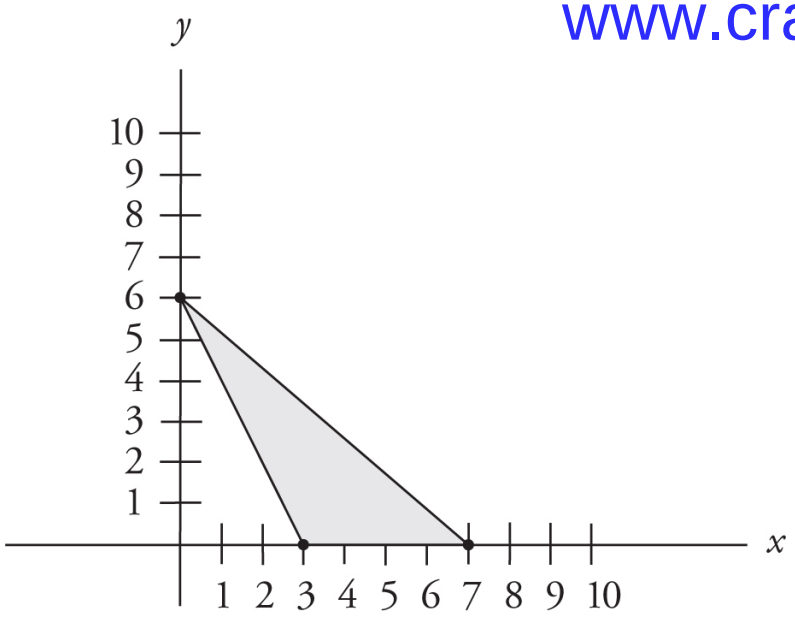
1. What is the value of x?



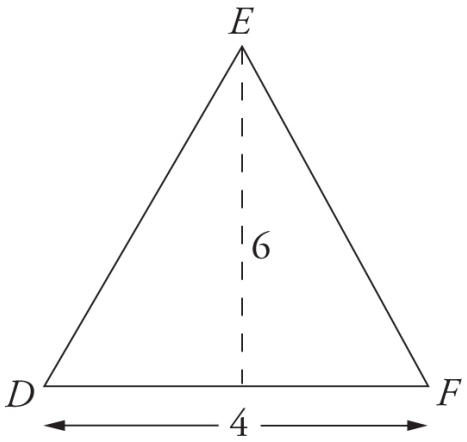
2. Triangle PQR is an isosceles triangle. $PQ = QR$. What is the value of x?



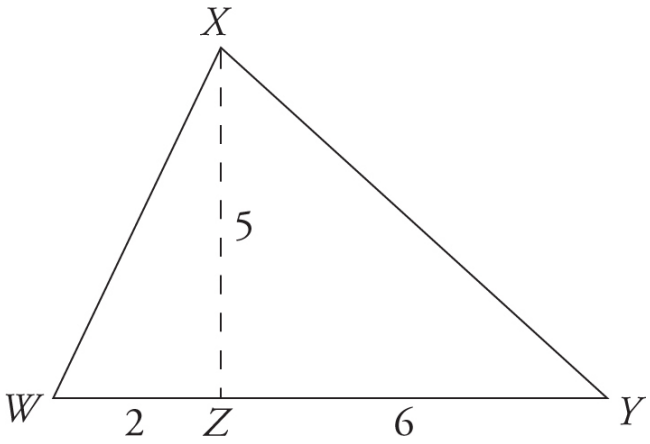
3. What is the area of right triangle ABC?



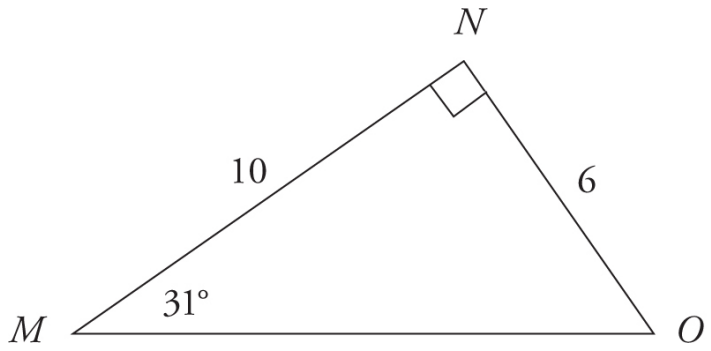
4. What is the area of the shaded region?

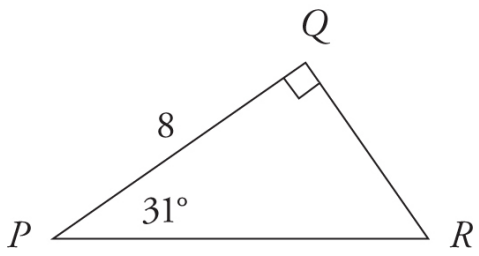


5. What is the area of triangle *DEF*?

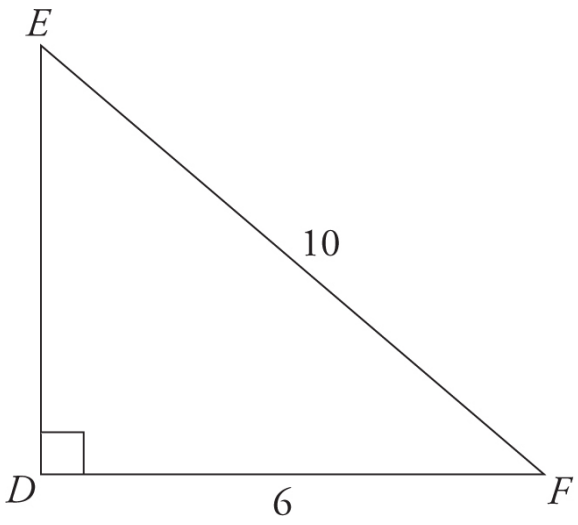


6. What is the area of triangle *WXZ*? Triangle *ZXY*? Triangle *WXY*?

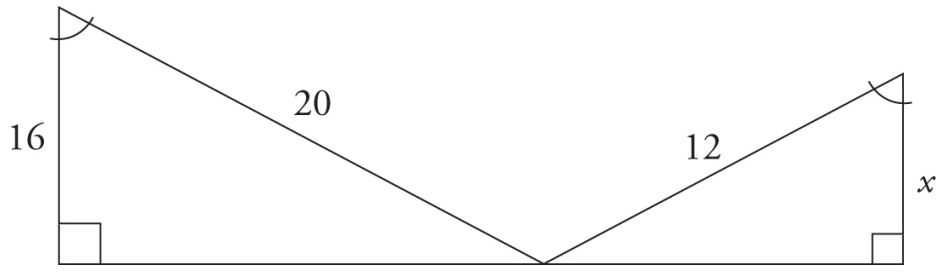




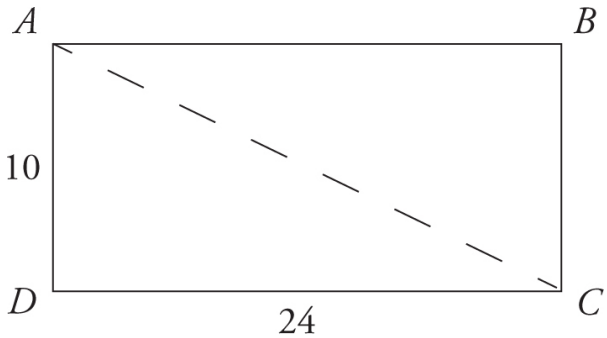
7. What is the length of line *QR*?



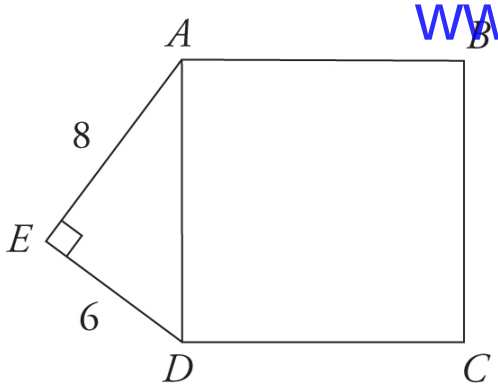
8. What is the length of side *DE*?



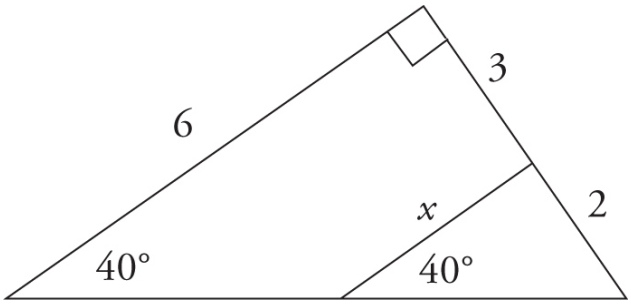
9. What is the value of *x*?



10. What is the length of the diagonal of rectangle *ABCD*?



11. What is the perimeter of square *ABCD*?



12. What is the value of x?

Practice Drill 26—Triangles

1. 45°

$180^\circ - 90^\circ = 90^\circ$. Since two sides (legs) of the triangle are both 3, the angles that correspond to those sides are also equal to each other. Therefore, each angle is 45°, so $x = 45^\circ$.

2. 70°

$180^\circ - 40^\circ = 140^\circ$. Since sides PQ and QR are equal, then $\angle QPR$ and x° are also equal to each other. Thus, divide 140° by 2 to find that each remaining angle is 70°. So $x = 70^\circ$.

3. 6

Plug the base and height into the area formula for a triangle: $A = \frac{1}{2}bh = \frac{1}{2}(4)(3) = 6$.

4. 12

In this case, count the height and base of the triangle by counting off the ticks on the coordinate plane. The height is 6 and the base is 4, which means that $A = \frac{1}{2}bh = \frac{1}{2}(4)(6) = 12$.

5. 12

Plug the base and height into the area formula for a triangle: $A = \frac{1}{2}bh = \frac{1}{2}(4)(6) = 12$.

6. $WXZ = 5$

$A = \frac{1}{2}bh = \frac{1}{2}(2)(5) = 5$

$ZXY = 15$

$A = \frac{1}{2}(6)(5) = 15$

$WXY = 20$

$A = \frac{1}{2}(2+6)(5) = 20$

7. 4.8

These are similar triangles since all the angles are the same. Set up a proportion to solve: $\frac{MN}{NO} = \frac{PQ}{QR}$, so $\frac{10}{6} = \frac{8}{QR}$. Cross-multiply to get $10(QR) = 6(8)$. Divide both sides by 10,

and $QR = 4.8$.

8. $DE = 8$

Since this is a right triangle, use the Pythagorean Theorem to find the missing side length: $a^2 + b^2 = c^2$, so $a^2 + 6^2 = 10^2$. Subtract 36 from both sides and $a^2 = 64$. Take the square root of both sides, and a (or DE) = 8.

9. 9.6

These are similar triangles since all the angles are the same. Set up a proportion to solve:

$\frac{16}{20} = \frac{x}{12}$. Cross-multiply to get $16(12) = 20(x)$. Divide both sides by 20, and $x = 9.6$.

10. 26

Remember that all angles in a rectangle are right angles. This diagonal (AC) cuts the rectangle into two right triangles, so use the Pythagorean Theorem to find the missing side length: $a^2 + b^2 = c^2$, so $10^2 + 24^2 = c^2$, and c (or AC) = 26.

11. 40

First, use the right triangle to find AD, which is one side of the square $ABCD$. $8^2 + 6^2 = c^2$, so $c = 10$. Since all sides of a square are equal, the perimeter is $10 + 10 + 10 + 10 = 40$ (or $10(4) = 40$).

12. 2.4

These are similar triangles since all the angles are the same. Set up a proportion to solve:

$\frac{6}{3+2} = \frac{x}{2}$. Cross-multiply to get $5x = 6(2)$. Divide both sides by 5, and $x = 2.4$.