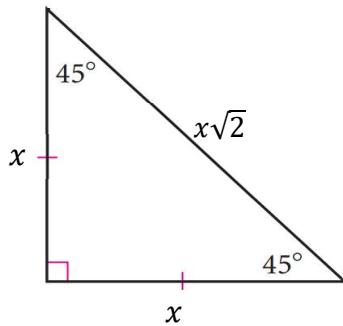
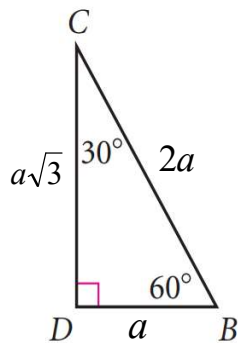


Lesson 9.3 – Two Special Right Triangles

Isosceles Right Triangle Conjecture - In an isosceles right triangle, if the legs have length x , then the hypotenuse has length $x\sqrt{2}$.

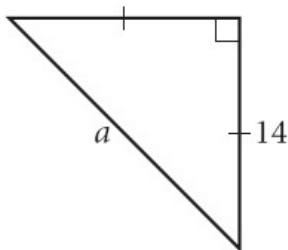


30° - 60° - 90° Triangle Conjecture - In a 30° - 60° - 90° , if the shorter side has length a , then the longer leg has length $a\sqrt{3}$, and the hypotenuse has length $2a$.

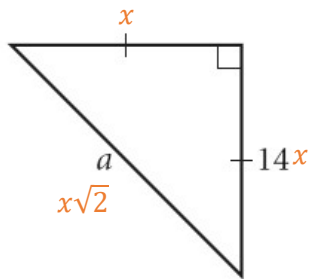


Example 1: Find the exact value of the unknown measure.

$a =$ _____



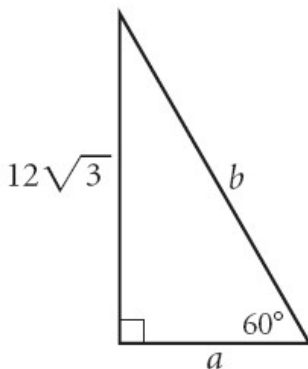
We are given an isosceles right triangle so we will use the “Isosceles Right Triangle Conjecture.”



We are given that $x = 14$. Since $a = x\sqrt{2}$, we can substitute 14 for x to get $a = 14\sqrt{2}$.

Example 2: Find the exact value of the unknown measure.

$a = \underline{\hspace{2cm}}$, $b = \underline{\hspace{2cm}}$



We are given a triangle that shows a 60° and a 90° angle. We can solve for the third angle to find that it is 30° . So, we will use the “ 30° - 60° - 90° Triangle Conjecture.”

We are given that $a\sqrt{3} = 12\sqrt{3}$. So, we can solve for a .

$$\frac{a\sqrt{3}}{\sqrt{3}} = \frac{12\sqrt{3}}{\sqrt{3}}$$

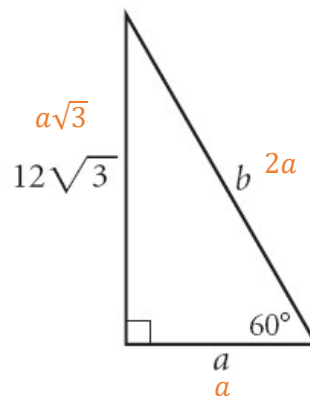
$$a = a$$

$$a = 12$$

$$b = 2a$$

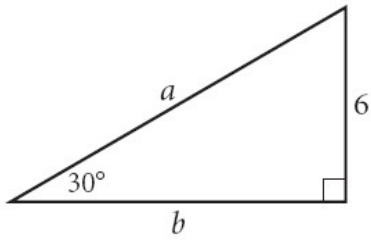
$$b = 2(12)$$

$$b = 24$$



Example 3: Find the exact value of the unknown measure.

$a = \underline{\hspace{2cm}}, b = \underline{\hspace{2cm}}$



We are given a triangle that shows a 30° and a 90° angle. We can solve for the third angle to find that it is 60° . So, we will use the “ 30° - 60° - 90° Triangle Conjecture.”

We are given that $a = 6$.

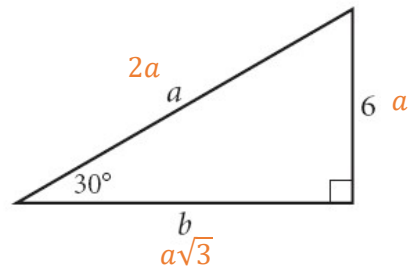
$$b = a\sqrt{3}$$

$$b = 6\sqrt{3}$$

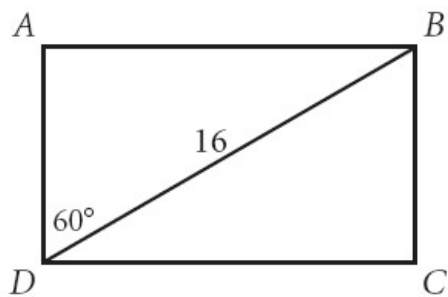
$$a = 2a$$

$$a = 2(6)$$

$$a = 12$$



Example 4: Find the area of rectangle $ABCD$



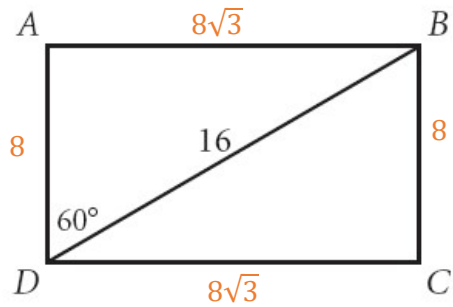
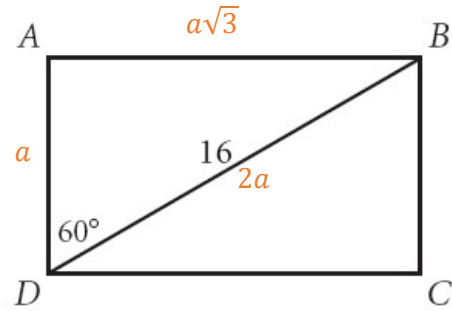
We are given a triangle that shows a 60° and we know a rectangle has 90° angles. We can solve for the third angle to find that it is 30° . So, we will use the “ 30° - 60° - 90° Triangle Conjecture.”

We are given that $2a = 16$.

$$\frac{2a}{2} = \frac{16}{2}$$

$$a = 8$$

$$a\sqrt{3} = 8\sqrt{3}$$



To find the area of a rectangle, we use $A = bh$.

$$A = (8\sqrt{3}) \cdot (8)$$

$$A = 64\sqrt{3} \text{ units}^2$$