

Warm up:

Simplify each expression.

1. $\sqrt{121} = 11$

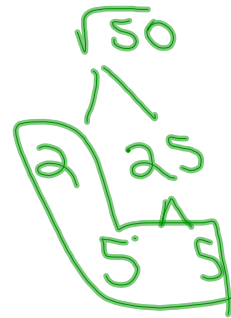
2. $\sqrt{63} = 3\sqrt{7}$

3. $\sqrt{6} \cdot \sqrt{8} = \sqrt{3 \cdot 2 \cdot 2 \cdot 2}$
 $= 4\sqrt{3}$

4. $\frac{\sqrt{78}}{\sqrt{39}} = \sqrt{\frac{78}{39}} = \sqrt{2}$ $4^2 = 50$

5. $\frac{\sqrt{2}}{\sqrt{7}} \cdot \frac{\sqrt{7}}{\sqrt{7}} = \frac{\sqrt{14}}{7}$

$\sqrt{2 \cdot 5 \cdot 5}$
 $= 5\sqrt{2}$



OBJECTIVE: You will learn to use the properties of 45° - 45° - 90° triangles.

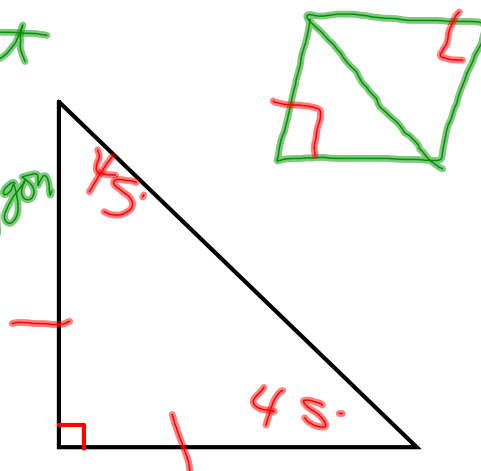
Section 13-2

1-25-12

diagonal-- a segment joining two nonconsecutive vertices of a polygon

45° - 45° - 90° triangles --

isos., right



Hands on Geometry

Step 1: Draw a square with sides 4 cm long. Label its vertices A, B, C, D.

Step 2: Draw the diagonal \overline{AC} .

Questions:

1. Use a protractor to measure $\angle CAB$ and $\angle ACB$.

$$m\angle CAB = 45$$

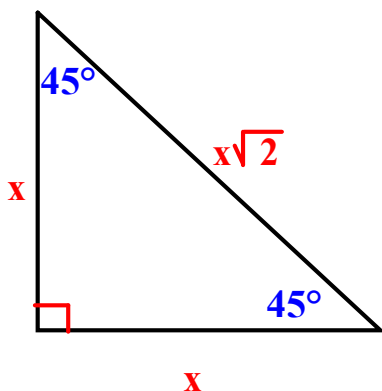
$$m\angle ACB = 45$$

2. Use the Pythagorean Theorem to find AC. Write your answers in simplest form.

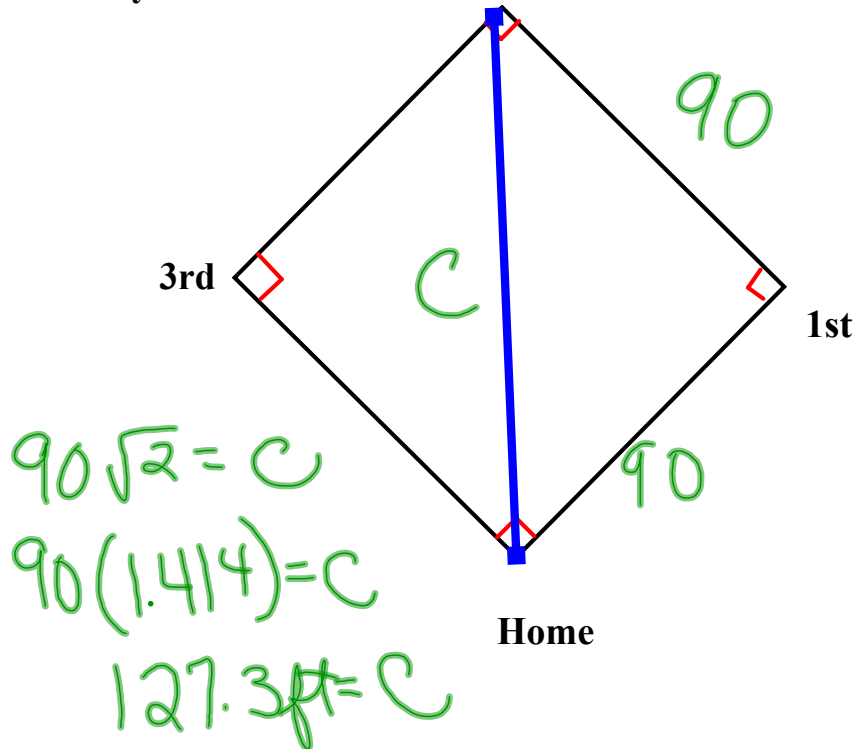
$$\begin{aligned} AC &= \sqrt{4^2 + 4^2} \\ &= \sqrt{32} \\ &= \sqrt{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2} \\ &= 4\sqrt{2} \end{aligned}$$

$$\begin{aligned} 32 &= 2 \cdot 16 \\ &= 2 \cdot 2 \cdot 8 \\ &= 2 \cdot 2 \cdot 2 \cdot 4 \\ &= 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \end{aligned}$$

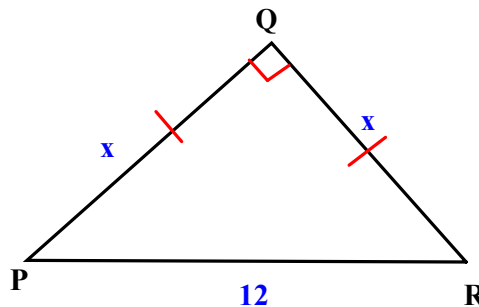
45°-45°-90° Triangle Theorem --In a 45°-45°-90° triangle, the hypotenuse is $\sqrt{2}$ times the length of a leg.



Example 1: An official baseball diamond is a square with sides 90 feet long. How far is it from home plate to second base? Round your answer to the nearest tenth.



Example 2: If $\triangle PQR$ is an isosceles right triangle and the measure of the hypotenuse is 12, find x . Write the answer in simplest form.



$$\begin{aligned}
 \frac{x\sqrt{2}}{\sqrt{2}} &= \frac{12}{\sqrt{2}} \\
 x &= \frac{12}{\sqrt{2}} \frac{\sqrt{2}}{\sqrt{2}} \\
 &= \frac{12\sqrt{2}}{2} \\
 &= 6\sqrt{2}
 \end{aligned}$$

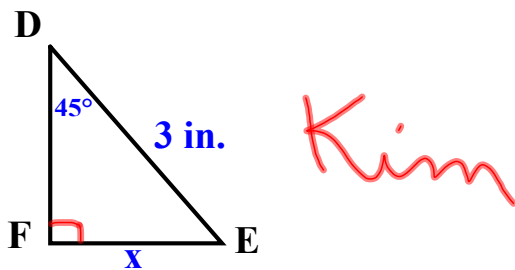
Guided Practice:

1. Explain the different methods for finding the length of the hypotenuse of a 45° - 45° - 90° triangle.

$$a^2 + b^2 = c^2 \qquad \text{leg } \sqrt{2}$$

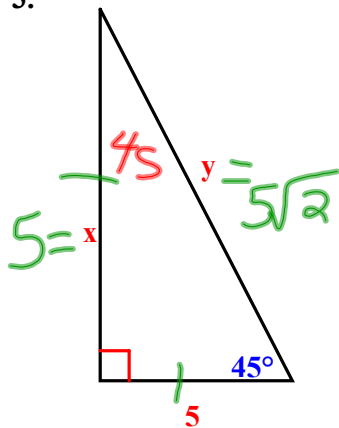
2. You Decide. Jane says that the length of a leg of $\triangle DEF$ is $3\sqrt{2}$ inches. Kim says the length of a leg is $\frac{3\sqrt{2}}{2}$ inches.

Who is correct? Explain your reasoning.

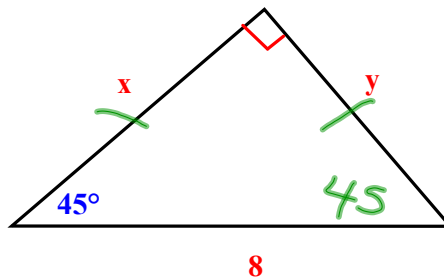


Find the missing measures. Write all radicals in simplest form.

3.



4.



$$\begin{aligned} x\sqrt{2} &= 8 \\ \frac{x\sqrt{2}}{\sqrt{2}} &= \frac{8}{\sqrt{2}} \\ x &= \frac{8}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} \\ &= \frac{8\sqrt{2}}{2} \\ y &= x = 4\sqrt{2} \end{aligned}$$

Do you have any Vocab questions?

OBJECTIVE:

HOMEWORK: p. 557 - 558

7 - 16, 18 - 20