

Name:

Date:

Period: 4

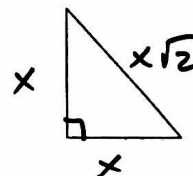
Special Right Triangles

Lesson Objective | WBAT apply special right $\triangle$ rules

45°-45°-90° Triangle Theorem

In a 45°-45°-90° triangle, the hypotenuse is $\sqrt{2}$ times as long as each leg.

$$\text{hyp} = \text{leg}\sqrt{2}$$

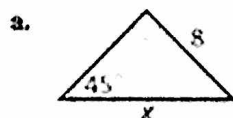


Examples:

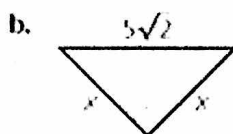
1. Find the value of x. Write your answer in simplest form.

$$5\sqrt{2} = \text{leg}\sqrt{2}$$

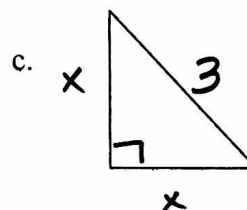
$$3 = \text{leg}\sqrt{2}$$



$$x = 8\sqrt{2}$$



$$x = 5$$



$$x = \frac{3}{\sqrt{2}} \left(\frac{\sqrt{2}}{\sqrt{2}} \right)$$

$$x = \frac{3\sqrt{2}}{2}$$

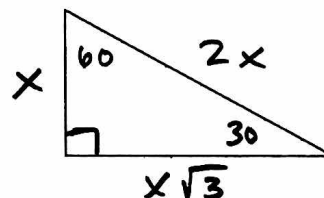
30°-60°-90° Triangle Theorem

In a 30°-60°-90° triangle...

1. the hypotenuse is twice as long as the shorter leg

AND

2. the longer leg is $\sqrt{3}$ times as long as the shorter leg

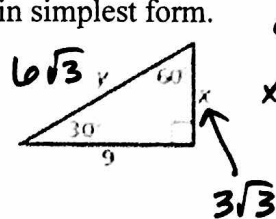


$$\text{hyp} = 2SL$$

$$LL = SL\sqrt{3}$$

Examples:

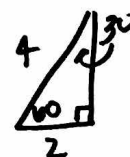
2. Find the values of x and y. Write your answer in simplest form.



$$9 = x\sqrt{3}$$

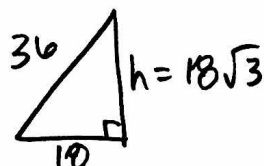
$$x = \frac{9}{\sqrt{3}} \left(\frac{\sqrt{3}}{\sqrt{3}} \right) = \frac{9\sqrt{3}}{3} = 3\sqrt{3}$$

3. What is the altitude of the triangle below?



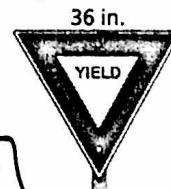
$$h = 2\sqrt{3}$$

4. A road sign is shaped like an equilateral triangle. Estimate the *area* of the sign by finding the area of the equilateral triangle. Round your answer to the nearest hundredth, if necessary.



$$A = \frac{(36)(18\sqrt{3})}{2} = 324\sqrt{3} \text{ in}^2$$

$$\approx 561.18 \text{ in}^2$$



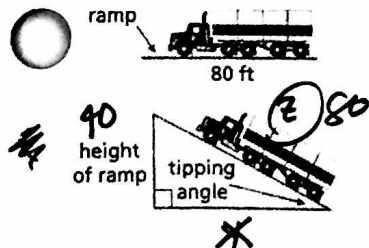
5. A tipping platform is a ramp used to unload trucks. How high is the end of an 80-foot ramp when the tipping angle is...

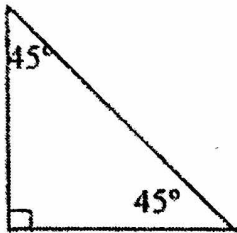
- a. 30°? Find the EXACT length, then round to the **nearest hundredth**, if necessary.

$$= 40 \text{ ft}$$

- b. 45°? Find the EXACT length, then round to the **nearest hundredth**, if necessary.

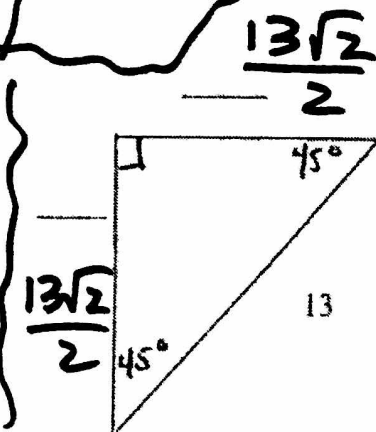
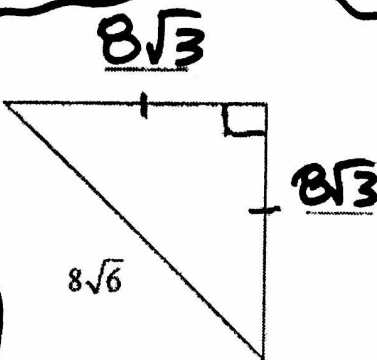
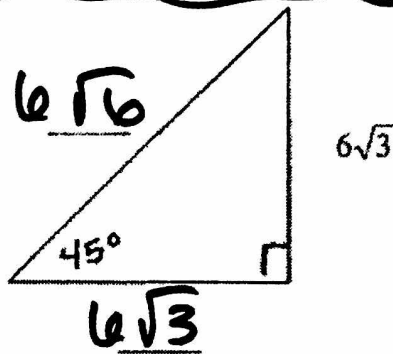
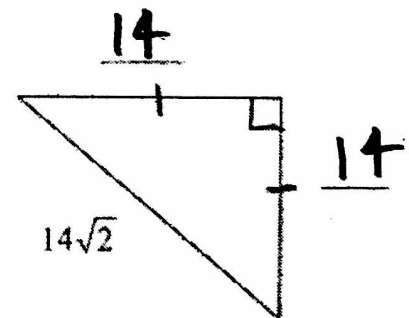
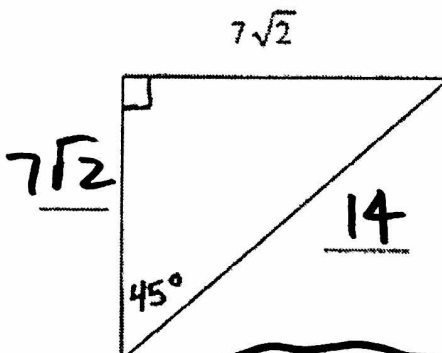
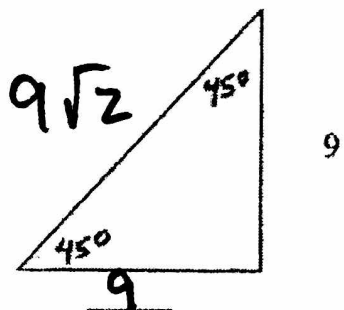
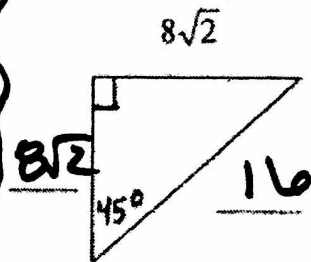
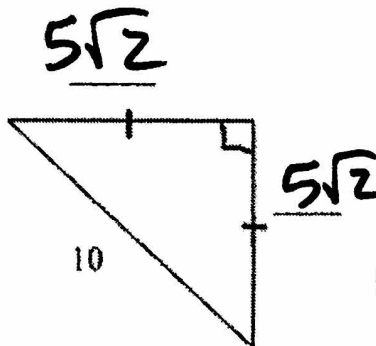
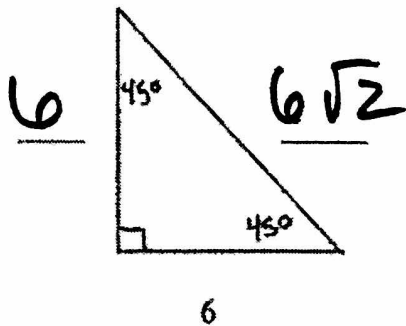
$$= 40\sqrt{2} \text{ ft} \approx 56.57 \text{ ft}$$

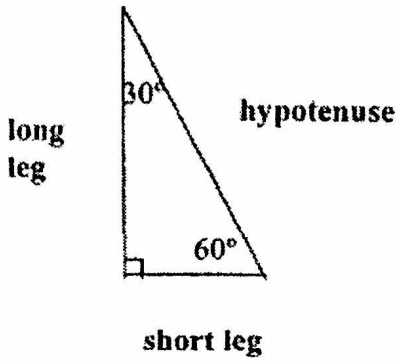




$$\text{Hypotenuse} = \text{leg} * \sqrt{2}$$

Find the missing sides of the triangles. Each triangle measures 45-45-90°. Leave answers in simplified radical form.





Hypotenuse = twice the short leg

Long leg = short leg * $\sqrt{3}$

Find the missing sides of the triangles. Each triangle measures 30-60-90°. Leave answers in simplified radical form.

