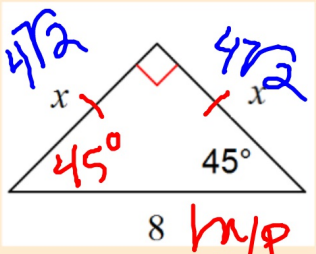
Welcome Back MYP Math 9!

	Assignment Effort Grade (Circle One)	Comments (What was interesting or challenging?)
Monday Date: 12/11 Topic: Unit 3 test Friday - no HW!	0 1 2	
Tuesday Date: 12/12 Topic: 5AB Multiplying Radicals	0 1 2	
Wednesday Date: 12/13 Topic: 5B Multiplying Radicals	0 1 2	
Thursday Date: 12/14 Topic: 5C Simplifying Radicals	0 1 2	
Friday Date: _____ Topic: _____	0 1 2	

Warm-up: Solve for ***x***. Leave your answer in exact radical form.



$4\sqrt{2}$ $4\sqrt{2}$ hyp

$a^2+b^2=c^2$

$x^2+x^2=8^2$

$\frac{2x^2}{2}=\frac{64}{2}$

$x^2=32$

$x=\sqrt{32}$

$x=\sqrt{16\cdot 2}=4\sqrt{2}$

Class Plan:

1. Warm-up
2. Special Right Triangles Part 1: *Isosceles Right Triangle*
3. Examples
4. Practice

Investigation: Special Right Triangles

1. Solve for the hypotenuse length in the Isosceles Right Triangles (45°- 45°- 90°)

Isosceles Right Triangle: (45° - 45° - 90°)
Step 1: Use the legs and the Pythagorean Theorem to find the hypotenuse in EXACT RADICAL FORM.

Isosceles Right Triangle	Show your work to find ***h***.
	
	
	
	

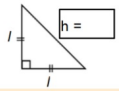
2. Find the pattern!

Step 2: Generalize the patterns you observed in step 1.

a) Use the lengths of the legs of an isosceles triangle to find the hypotenuse – WITHOUT USING THE PYTHAGOREAN THEOREM!

Leg length	5	6	11	123,456
Hypotenuse length				

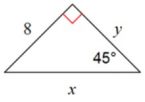
b) Suppose the length of the legs is ***l***. What is the hypotenuse? _____
Try to complete the triangle using this relationship.



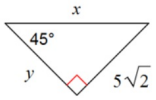
3. Use the pattern to solve ... then help each other!

Step 3: Practice! Use your relationship from the front page!

1) Find the length of ***x*** and ***y***.



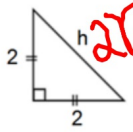
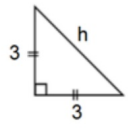
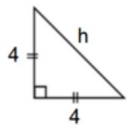
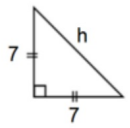
2) Find the length of ***x*** and ***y***.



Investigation: Special Right Triangles

Isosceles Right Triangle: $(45^\circ - 45^\circ - 90^\circ)$

Step 1: Use the legs and the Pythagorean Theorem to find the hypotenuse in EXACT RADICAL FORM.

Isosceles Right Triangle	Show your work to find ***h***.
 $2\sqrt{2}$	$2^2+2^2=h^2$ $h^2=8$ $4+4=h^2$ $h=\sqrt{8}$ $h=\sqrt{4\cdot 2}=\boxed{2\sqrt{2}}$
	$3^2+3^2=h^2$ $h^2=18$ $9+9=h^2$ $h=\sqrt{18}=\sqrt{9\cdot 2}=3\sqrt{}$
	
	$7^2+7^2=h^2$ $h^2=98$ $h=\sqrt{98}=\sqrt{49\cdot 2}$

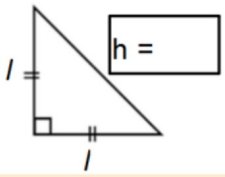
Investigation: Special Right Triangles

<u>Step 2:</u> Generalize the patterns you observed in step 1.

a) Use the lengths of the legs of an isosceles triangle to find the hypotenuse – WITHOUT USING THE PYTHAGOREAN THEOREM!

Leg length	5	6	11	123,456
Hypotenuse length				

b) Suppose the length of the legs is ***l***. What is the hypotenuse? _____
Try to complete the triangle using this relationship.

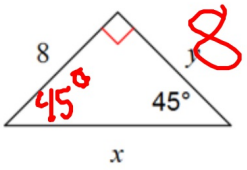


Investigation: Special Right Triangles

Use the leg to find the other leg and hypotenuse.

Step 3: Practice! Use your relationship from the front page!

1) Find the length of **x** and **y**.

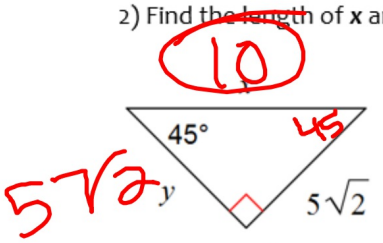


8

45°

$x = 8\sqrt{2}$

2) Find the length of **x** and **y**.



10

45

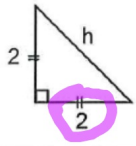
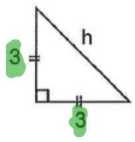
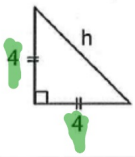
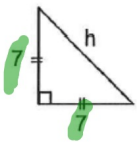
$5\sqrt{2}$

$x = 5\sqrt{2}(\sqrt{2})$

$x = 5 \cdot 2 = 10$

Investigation: Special Right Triangles

Solutions

Isosceles Right Triangle	Show your work to find ***h***.
	$2^2+2^2=h^2$ $4+4=h^2$ $8=h^2$ $h=\sqrt{8}$ $h=2\sqrt{2}$
	$3^2+3^2=h^2$ $9+9=h^2$ $18=h^2$ $h=\sqrt{18}$ $h=\sqrt{9\cdot2}$ $h=3\sqrt{2}$
	$4^2+4^2=h^2$ $16+16=h^2$ $32=h^2$ $h=\sqrt{32}$ $h=\sqrt{16\cdot2}$ $h=4\sqrt{2}$
	$7^2+7^2=h^2$ $49+49=h^2$ $98=h^2$ $h=\sqrt{98}$ $\sqrt{2}$ $\sqrt{49}$ $\sqrt{2}\cdot\sqrt{7}$ $7\sqrt{2}$

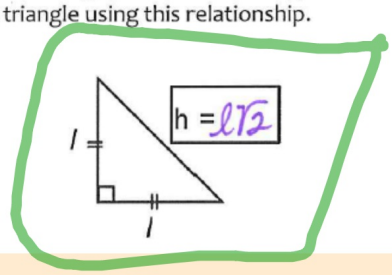
Investigation: Special Right Triangles
Solutions

Step 2: Generalize the patterns you observed in step 1.

a) Use the lengths of the legs of an isosceles triangle to find the hypotenuse – WITHOUT USING THE PYTHAGOREAN THEOREM!

Leg length	5	6	11	123,456
Hypotenuse length	$5\sqrt{2}$	$6\sqrt{2}$	$11\sqrt{2}$	$123456\sqrt{2}$

b) Suppose the length of the legs is l. What is the hypotenuse? $l\sqrt{2}$
Try to complete the triangle using this relationship.

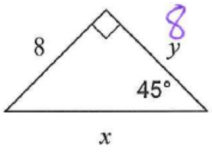


Investigation: Special Right Triangles

Solutions

Step 3: Practice! Use your relationship from the front page!

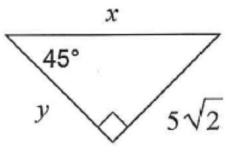
1) Find the length of **x** and **y**.



$y = 8$

$x = 8\sqrt{2}$

2) Find the length of **x** and **y**.



$y = 5\sqrt{2}$

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

$x = 5 \cdot 2$

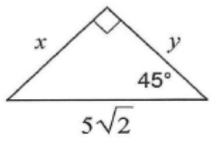
$x = 10$

Investigation: Special Right Triangles

Solutions

Use the hypotenuse and the 45-45-90 rule to find the legs.

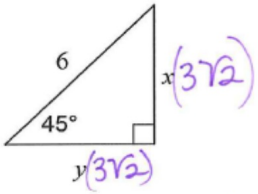
3) Find the length of **x** and **y**.



$x = y = \frac{5\sqrt{2}}{\sqrt{2}}$

$x = y = 5$

4) **Challenge**



$x = y \qquad \frac{6}{\sqrt{2}} = \frac{x\sqrt{2}}{\sqrt{2}}$

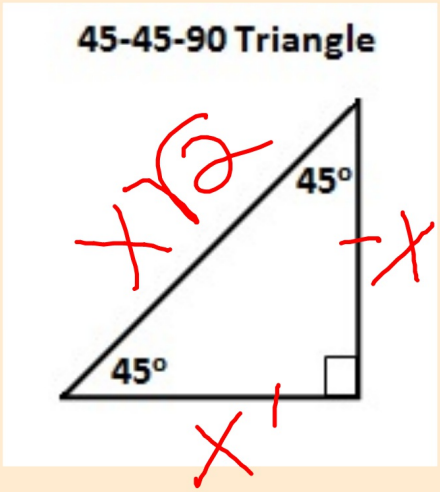
$x = \frac{6}{\sqrt{2}}$

$x = \frac{6}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{6\sqrt{2}}{2}$

$x = 3\sqrt{2}$

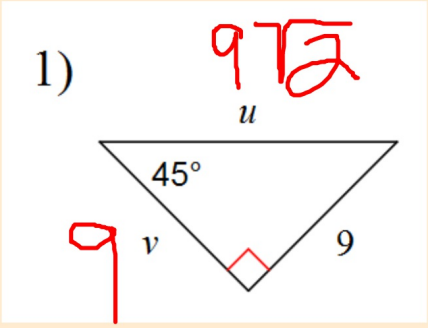
Isosceles Right Triangle: What is the relationship between legs and the hypotenuse? Draw and record in your notebook.

at the top of HW!



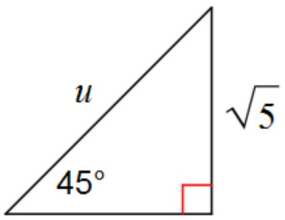
Example: solve for *u* and *v*

1)



Example: solve for *u*.

2)



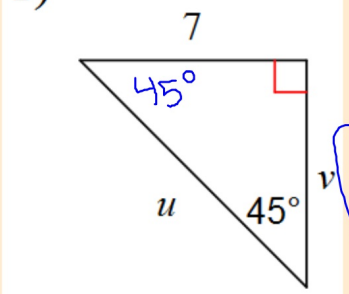
$u = \sqrt{5} \cdot \sqrt{2}$

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

$u = \sqrt{10}$

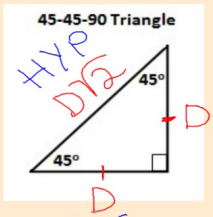
Solve for the missing side lengths. Use simplest radical form.

1)



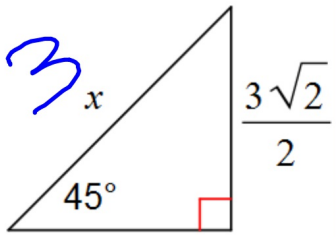
$v = 7$

$u = 7\sqrt{2}$

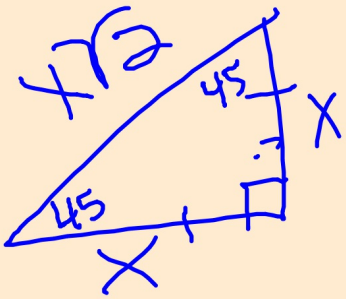


Solve for the missing side lengths.
Use simplest radical form.

2)



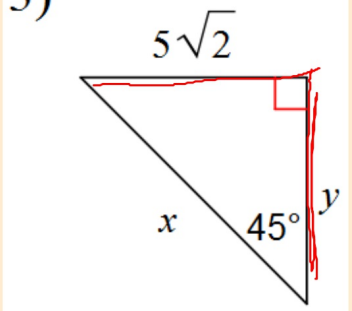
$\frac{3\sqrt{2}}{2}$



$\frac{3\sqrt{2}}{2} \cdot \frac{\sqrt{2}}{1} = \frac{3 \cdot 2}{2} = 3$

Solve for the missing side lengths.
Use simplest radical form.

3)



$y = 5\sqrt{2}$

$x = 5(\sqrt{2})(\sqrt{2})$

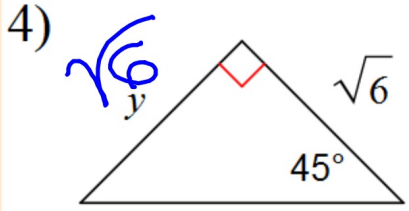
$x = 10$

$x = 5 \cdot 2$

$5\sqrt{4}$

Solve for the missing side lengths.
Use simplest radical form.

4)



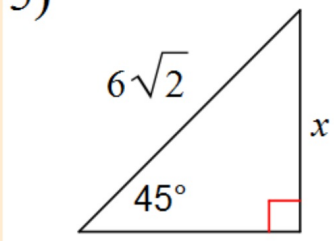
$x = \sqrt{6} \cdot \sqrt{2} = \sqrt{12}$

$x = \sqrt{4 \cdot 3}$

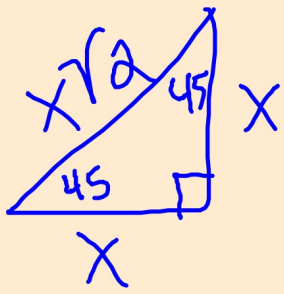
$x = 2\sqrt{3}$

Solve for the missing side lengths.
Use simplest radical form.

5)



6

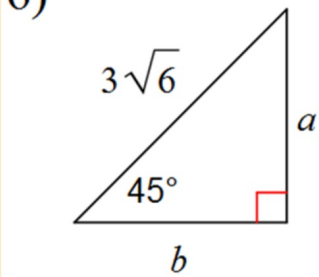


6

$$\frac{x\sqrt{2}}{\sqrt{2}} = \frac{6\sqrt{2}}{\sqrt{2}}$$

Solve for the missing side lengths.
Use simplest radical form.

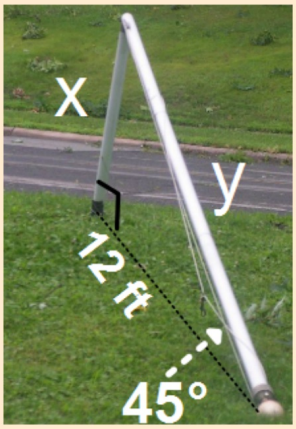
6)



$\frac{3\sqrt{6}}{\sqrt{2}} = \frac{x\sqrt{2}}{\sqrt{2}}$

$3\sqrt{3}$

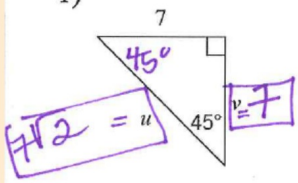
To the nearest foot, find the original height of a fallen flagpole that cracked and fell as if hinged, forming an angle of 45 degrees with the ground. The tip of the pole hit the ground 12 feet from its base.



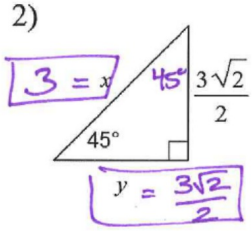
Solutions

Find the missing side lengths. Leave your answers as radicals in simplest form.

1)



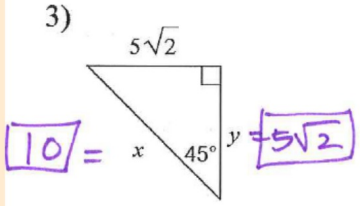
2)



$\frac{3\sqrt{2}}{2} \cdot \sqrt{2} = \frac{3\sqrt{4}}{2} = \frac{3 \cdot 2}{2} = 3$

Solutions

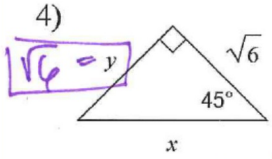
3)



10 = x y = 5√2

$5\sqrt{2} \cdot \sqrt{2} = 5\sqrt{4} = 5 \cdot 2 = 10$

4)

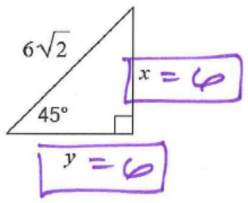


√6 = y

$\sqrt{6} \cdot \sqrt{2} = \sqrt{12} = \sqrt{4 \cdot 3} = 2\sqrt{3}$

Solutions

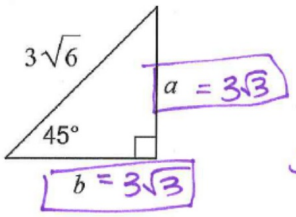
5)



$$\frac{3\sqrt{6}}{\sqrt{2}} = 3\cdot\sqrt{\frac{6}{2}}$$

$$= 3\sqrt{3}$$

6)



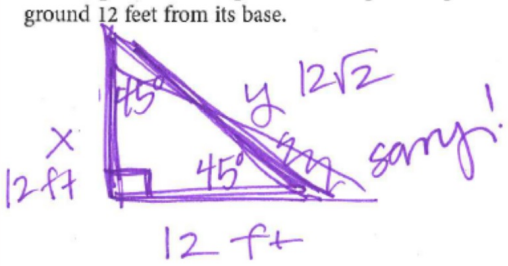
$$\frac{3\sqrt{6}}{\sqrt{2}} = \frac{x\sqrt{2}}{\sqrt{2}}$$

$$3\cdot\sqrt{\frac{6}{2}}$$

$$3\sqrt{3}$$

Solutions

To the nearest foot, find the original height of a fallen flagpole that cracked and fell as if hinged, forming an angle of 45 degrees with the ground. The tip of the pole hit the ground 12 feet from its base.



sorry!

$12 + 12\sqrt{2}$

≈ 28.97

≈ 29 ft tall