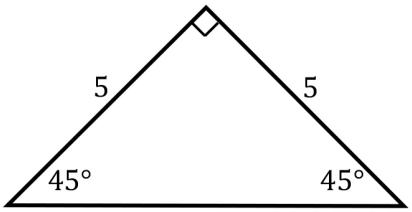
TOPIC: SPECIAL RIGHT TRIANGLES

45-45-90 Triangles

◆ In triangles with 45° angles, the 2 legs are always the _____ length.

- The hypotenuse will always be a multiple of the leg length, which you can find using: **Recall** $a^2 + b^2 = c^2$

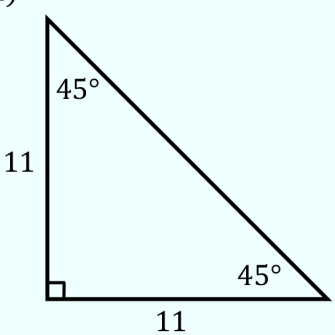


_____

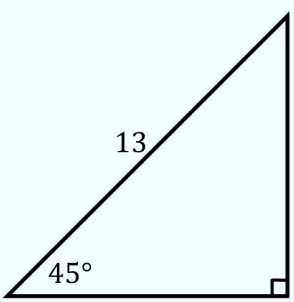
New
$hyp = leg \cdot \_\_\_$
(45 – 45 – 90)

EXAMPLE Solve for the unknown side(s) of each triangle.

(A)



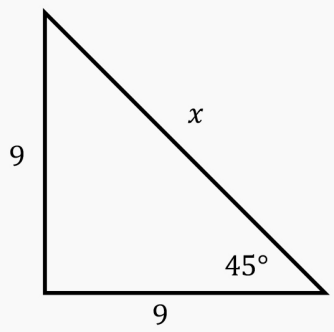
(B)



TOPIC: SPECIAL RIGHT TRIANGLES

PRACTICE

Given the triangle below, determine the missing side(s) without using the Pythagorean theorem (make sure your answer is fully simplified).



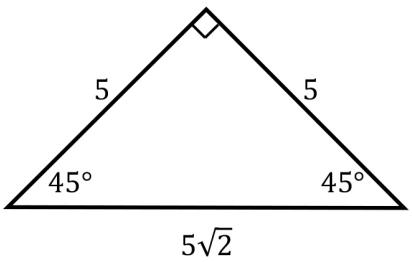
PRACTICE

Without using a calculator, determine all values of P in the interval $[0, 90°)$ with the following trigonometric function value.

$\csc P = \sqrt{2}$

TOPIC: SPECIAL RIGHT TRIANGLES

Common Trig Functions For 45-45-90 Triangles



◆ The common trig functions follow a specific pattern for 45-45-90 triangles.

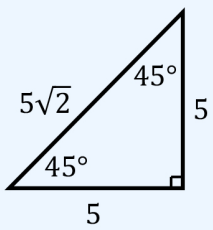
New	Trig Function Values for 45-45-90 Triangle		
sin	$= \frac{\textbf{Opp}}{\textbf{Hyp}} =$	**csc**	$= \frac{\mathbf{1}}{\boldsymbol{sin(\theta)}} =$
cos	$= \frac{\textbf{Adj}}{\textbf{Hyp}} =$	**sec**	$= \frac{\mathbf{1}}{\boldsymbol{cos(\theta)}} =$
tan	$= \frac{\textbf{Opp}}{\textbf{Adj}} =$	**cot**	$= \frac{\mathbf{1}}{\boldsymbol{tan(\theta)}} =$

TOPIC: SPECIAL RIGHT TRIANGLES

30-60-90 Triangles

◆ For the 30-60-90 triangle, relate side lengths to the *shortest* leg.

Recall **45 – 45 – 90**



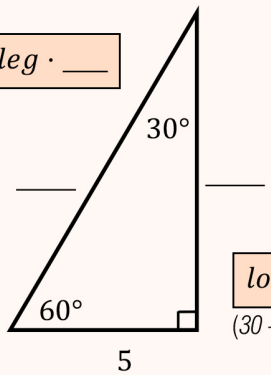
$hyp = leg \cdot \sqrt{2}$

(45 – 45 – 90)

New **30 – 60 – 90**

$hyp = short\ leg \cdot \_\_\_$

(30 – 60 – 90)

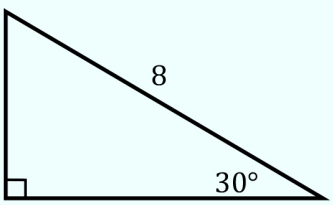


$long\ leg = short\ leg \cdot \_\_\_$

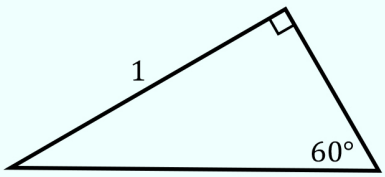
(30 – 60 – 90)

EXAMPLE Solve for the unknown sides of each triangle.

(*A*)



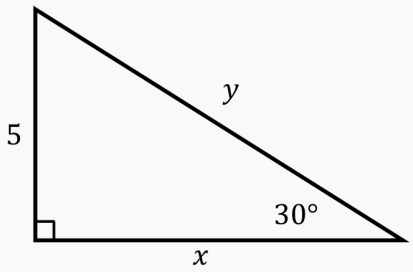
(*B*)



TOPIC: SPECIAL RIGHT TRIANGLES

PRACTICE

Given the triangle below, determine the missing side(s) without using the Pythagorean theorem (make sure your answer is fully simplified).



PRACTICE

Without using a calculator, determine all values of A in the interval $\left[0, \frac{\pi}{2}\right)$ with the following trigonometric function value.

$$\cos A = \frac{\sqrt{3}}{2}$$

TOPIC: SPECIAL RIGHT TRIANGLES

Common Trig Functions For 30-60-90 Triangles

◆ The common trig functions follow a specific pattern for 30-60-90 triangles.

New	Trig Function Values for 30-60-90 Triangle	
sin	$30° = \frac{\textbf{Opp}}{\textbf{Hyp}} =$	$60°$
cos	$30° = \frac{\textbf{Adj}}{\textbf{Hyp}} =$	$60°$
tan	$30° = \frac{\textbf{Opp}}{\textbf{Adj}} =$	$60°$
csc	$30° = \frac{\mathbf{1}}{\boldsymbol{sin(\theta)}} =$	$60°$
sec	$30° = \frac{\mathbf{1}}{\boldsymbol{cos(\theta)}} =$	$60°$
cot	$30° = \frac{\mathbf{1}}{\boldsymbol{tan(\theta)}} =$	$60°$