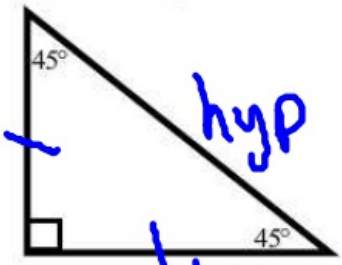
Geometry | Unit #3 – Right Triangle Trig | Notes

Name: _____ Date: _____

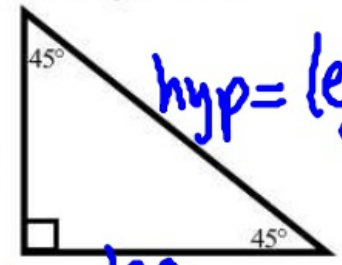
Special Right Triangles: $45^\circ - 45^\circ - 90^\circ$ & Pythagorean Theorem

UNIT QUESTION: What patterns can I find in right triangles?
Today's Question: How do I find the length of a side of a right triangle with only one side and an angle given?

45°, 45°, 90° Triangle Vocab.

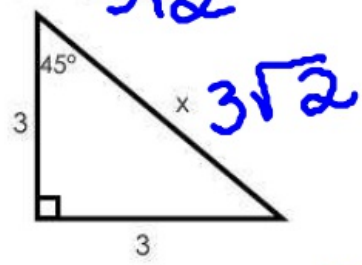


Reference Triangle Ratios

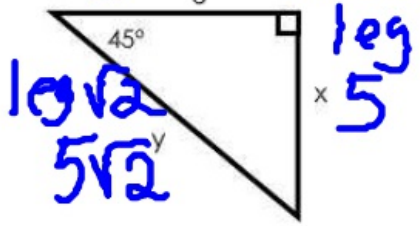


In a 45°, 45°, 90° triangle, the legs are congruent

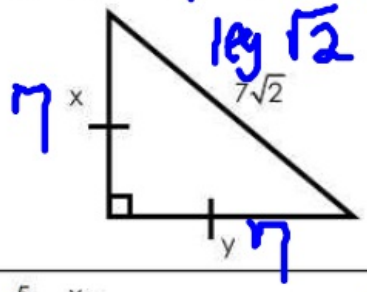
1. x = $3\sqrt{2}$



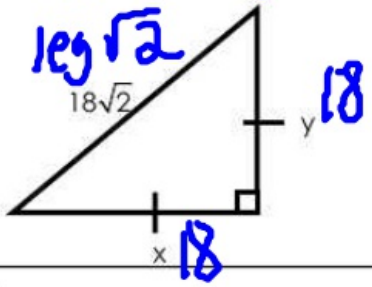
2. x = 5, y = $5\sqrt{2}$



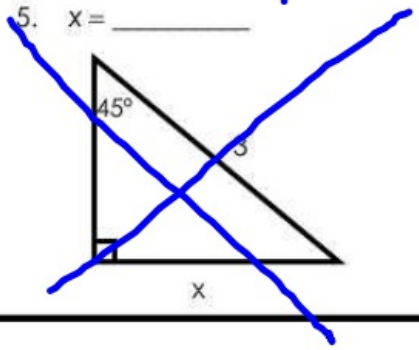
3. x = 7, y = 7



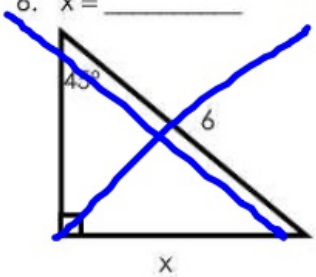
4. x = 18, y = 18



5. x = _____



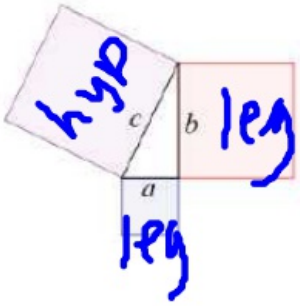
6. x = _____



Pythagorean Theorem

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

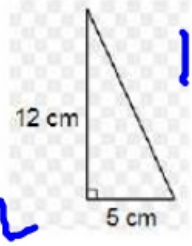
- c is the hypotenuse
- a and b are the legs



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

If x is the hypotenuse...

EX1:



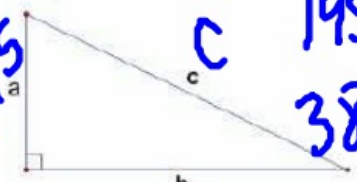
$12^2+5^2=c^2$

$144+25=c^2$

$\sqrt{169}=\sqrt{c^2}$

$13=c$

EX2: In a right triangle, if a = 195m and b= 28m, find C.



$195^2+28^2=c^2$

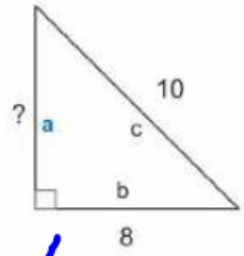
$38025+784$

$\sqrt{38809}=\sqrt{c^2}$

$197=c$

If x is a or b...

EX3:



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

$-b^2 \quad -b^2$

$a^2=c^2-b^2$

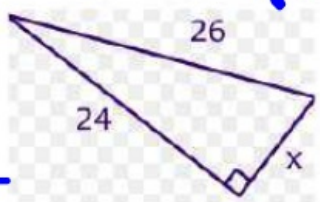
$10^2-8^2=a^2$

$100-64=a^2$

$\sqrt{36}=\sqrt{a^2}$

$6=a$

EX4:



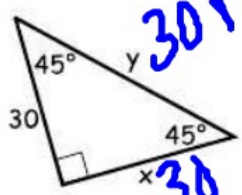
$26^2-24^2=x^2$

$676-576=x^2$

$\sqrt{100}=\sqrt{x^2}$

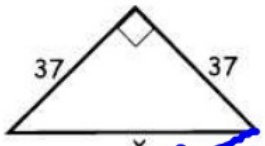
$10=x$

Find x and y.

1. 

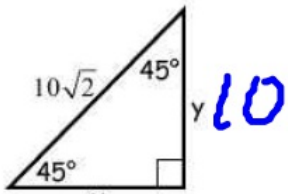
30√2
30

x = _____ y = _____

2. 

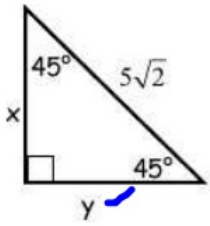
37√2

x = _____

3. 

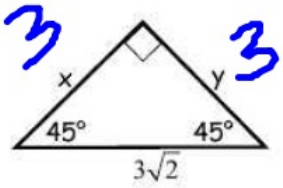
10
10

x = _____ y = _____

4. 

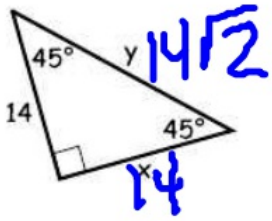
5
–

x = _____ y = _____

5. 

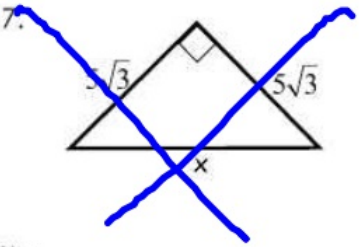
3
3

x = _____ y = _____

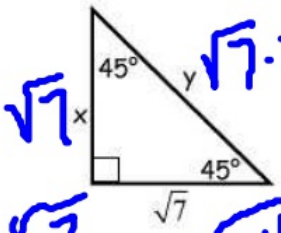
6. 

14√2
14

x = _____ y = _____

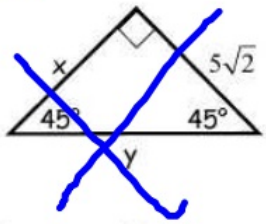
7. 

x = _____

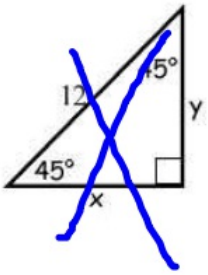
8. 

√7·√2 = √14
√7
√14

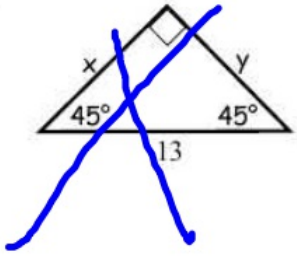
x = _____ y = _____

9. 

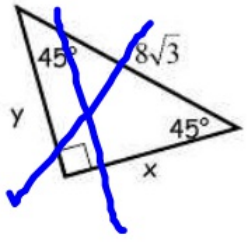
x = _____ y = _____

10. 

x = _____ y = _____

11. 

x = _____ y = _____

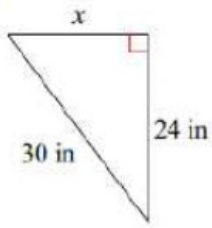
12. 

x = _____ y = _____

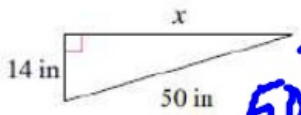
Missing hyp: $a^2+b^2=c^2$ Missing legs: $c^2-b^2=a^2$

Find the missing side of each triangle. Round your answers to the nearest tenth if necessary.

1)



2)



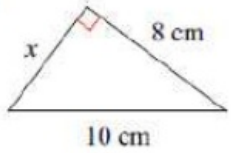
$50^2-14^2=x^2$

$2500-196=x^2$

$\sqrt{2304}=\sqrt{x^2}$

$48=x$

3)



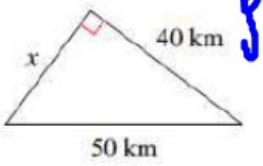
$50^2-40^2=x^2$

$2500-1600=x^2$

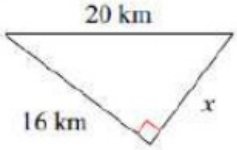
$\sqrt{900}=\sqrt{x^2}$

$30=x$

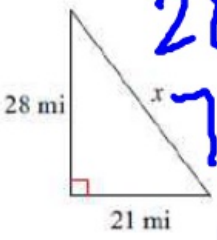
4)



5)



6)



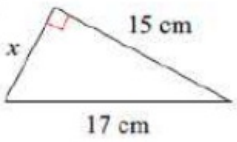
$28^2+21^2=x^2$

$784+441=x^2$

$\sqrt{1225}=\sqrt{x^2}$

$35=x$

7)



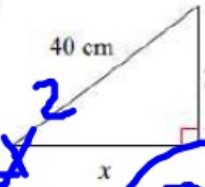
$40^2-24^2=x^2$

$1600-576=x^2$

$\sqrt{1024}=\sqrt{x^2}$

$32=x$

8)



Find the missing side of each right triangle. Side c is the hypotenuse. Sides a and b are the legs. Round your answers to the nearest tenth if necessary.

9) $a = 8$ ft, $b = 15$ ft

10) $a = 5$ ft, $c = 13$ ft

11) $b = 8$ mi, $c = 10$ mi

12) $a = 9$ m, $c = 15$ m

13) $a = 12$ ft, $c = 20$ ft