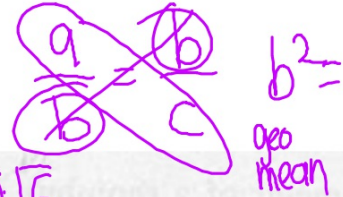




# WARMUP

Page 304 #1-3

$x^2 = 45$     $x = \sqrt{45}$

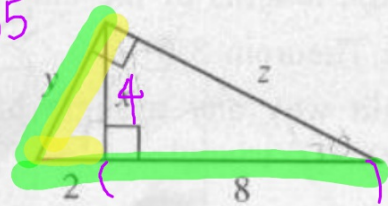


1. Find the geometric mean between 3 and 15.

$x^2 = (3) \cdot (15)$     $(\sqrt{9})(\sqrt{5})$     $3\sqrt{5}$

2. The diagram shows the altitude drawn to the hypotenuse of a right triangle.

a.  $x = \frac{?}{?}$     $x^2 = 16$     $x = \sqrt{16}$     $x = 4$   
 b.  $y = \frac{?}{?}$     $y = \sqrt{20}$     $2\sqrt{5}$   
 c.  $z = \frac{?}{?}$     $\sqrt{80}$



3. The sides of a triangle are given. Is the triangle acute, right, or obtuse?

a. 11, 60, 61    $a^2 + b^2 < c^2$   
 b. 7, 9, 11    $a^2 + b^2 > c^2$     $49 + 81 = 130 > 121$    *acute*

c. 0.2, 0.3, 0.4    $0.04 + 0.09 = 0.13 < 0.16$    *obtuse*

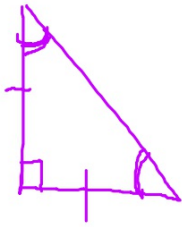
$121 + 3600 = 3721 < 3721$    *RIGHT*  
 $\frac{8}{z} = \frac{z}{10}$     $\frac{2}{y} = \frac{y}{10}$     $\frac{2 \cdot 8}{10} = \frac{8 \cdot 2}{10}$

# **SECTION 8.4: SPECIAL RIGHT TRIANGLES**

Standards:

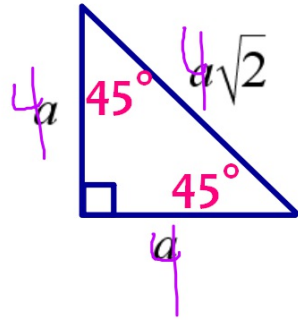
**DEFINITION**

An isosceles right  $\Delta$  is also called a  $45^\circ - 45^\circ - 90^\circ \Delta$   
since the measures of the angles are 45, 45, and 90



### THEOREM

In a 45-45-90  $\Delta$ , the hypotenuse is  $\sqrt{2}$  as long as a leg



hypotenuse =  $\sqrt{2}$  . leg

1 : 1 :  $\sqrt{2}$

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

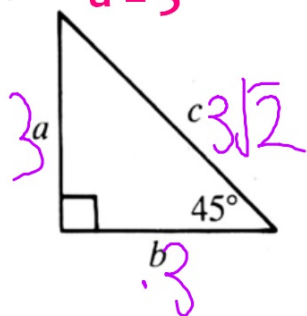
$$(1) + (1) = b^2$$

$$2 = b^2 \quad \sqrt{2} = b$$

### EXAMPLE I

Given the length of one side of the triangle, find the other two sides.

a)  $a = 3$

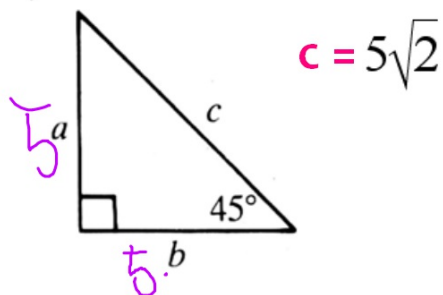


$$3^2 + 3^2 = c^2$$

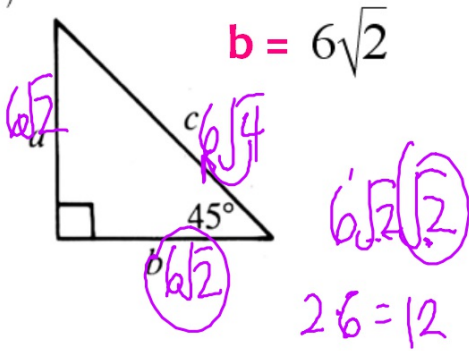
$$9 + 9 = c^2$$

$$\sqrt{18} = c$$

b)

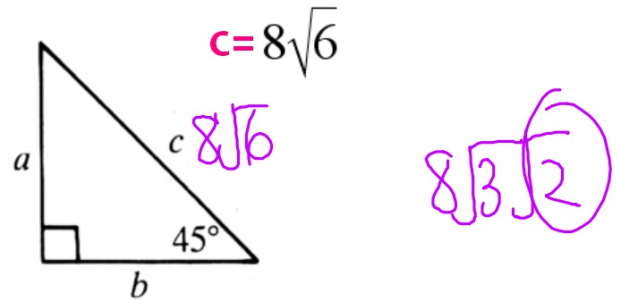


c)



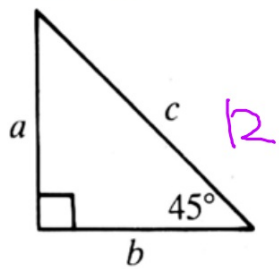
★  $a = 6\sqrt{2}$   
 $c = 12$

d)



★  $a = b = 8\sqrt{3}$

e)  $c = 12$

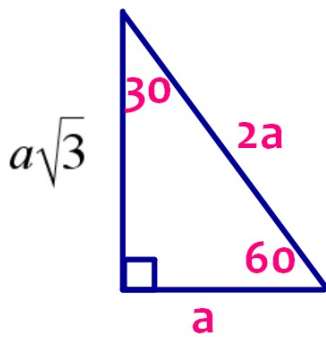


✦  $a = b = 6\sqrt{2}$

$$\frac{12\sqrt{2}}{\sqrt{2}\sqrt{2}} \quad \frac{12\sqrt{2}}{2}$$

## THEOREM

In a 30 - 60 - 90  $\Delta$ , the hypotenuse is twice as long as the shorter leg, and the longer leg is  $\sqrt{3}$  as long as the shorter leg.



hypotenuse = 2 short leg

$$c = 2a$$

longer leg =  $\sqrt{3}$  short leg

$$b = a\sqrt{3}$$

$$1 : \sqrt{3} : 2$$

$$30 \quad 60 \quad 90$$

$$1^2 + \sqrt{3}^2 = c^2$$

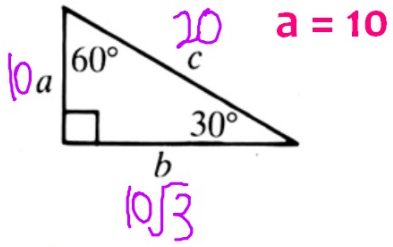
$$1 + 3 = c^2$$

$$\sqrt{4} = c$$

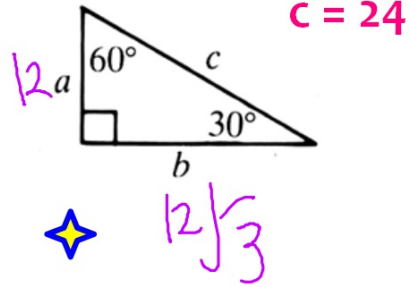
**EXAMPLE 2**

Given the length of one side of the triangle, find the other two sides.

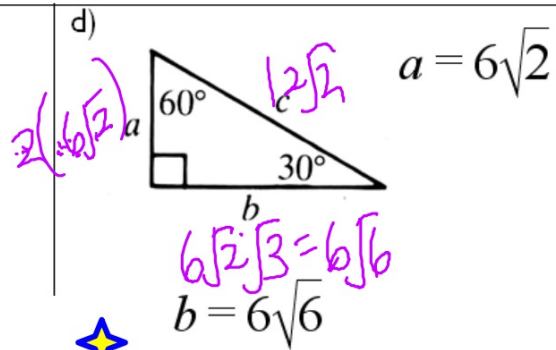
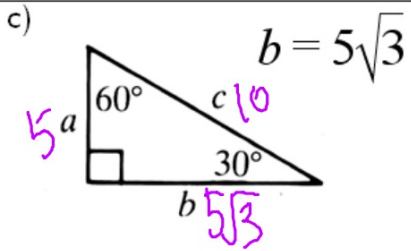
a)



b)

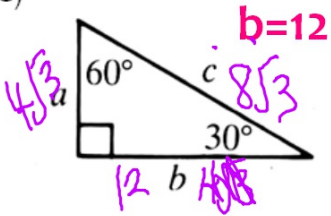


$$1 : \sqrt{3} : 2$$



$$\begin{array}{r}
 6\sqrt{2} \\
 + 6\sqrt{2} \\
 \hline
 12\sqrt{2}
 \end{array}$$

e)



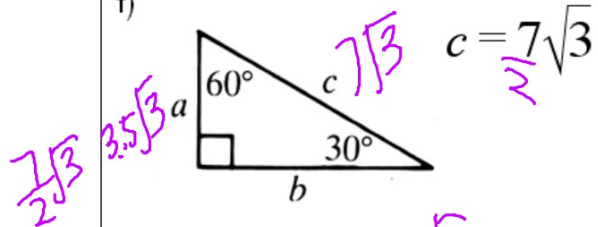
★  $a = 4\sqrt{3}$

$c = 8\sqrt{3}$

$\frac{12\sqrt{3}}{3\sqrt{3}\sqrt{3}}$

$\frac{12\sqrt{3}}{3}$

f)

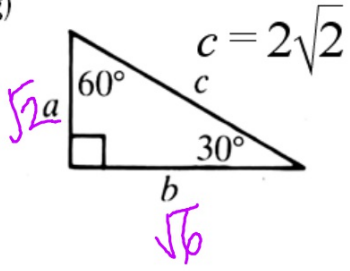


$\frac{7}{2}$

★  $a = \frac{7\sqrt{3}}{2}$

$\frac{7\sqrt{3}}{2b} = \frac{21}{2}$

g)



# HOMWORK

Assignment #8.4a

- Page 302 #1-18

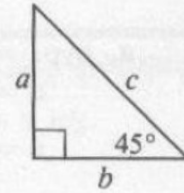
EVERY problem must have a picture

**\*\*FRIDAY FEB 3rd - PROOF QUIZ\*\***

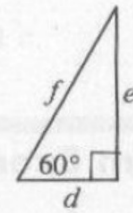
**\*\*TUESDAY FEB 7th - QUIZ 8.1-8.4\*\***

Copy and complete the tables.

	1.	2.	3.	4.	5.	6.	7.	8.
<i>a</i>	4	?	$\sqrt{5}$	?	?	?	?	?
<i>b</i>	?	$\frac{2}{3}$	?	?	?	?	$4\sqrt{2}$	?
<i>c</i>	?	?	?	$3\sqrt{2}$	6	$\sqrt{14}$	?	5



	9.	10.	11.	12.	13.	14.	15.	16.
<i>d</i>	7	$\frac{1}{4}$	?	?	?	?	?	?
<i>e</i>	?	?	$5\sqrt{3}$	6	?	?	3	?
<i>f</i>	?	?	?	?	10	13	?	$6\sqrt{3}$



17. Find the length of a diagonal of a square whose perimeter is 48.

18. A diagonal of a square has length 8. What is the perimeter of the square?

