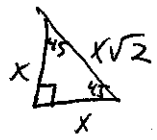
Notes

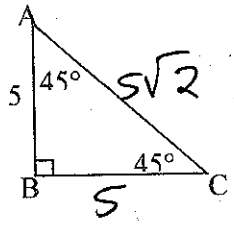
Geometry 5.8 Name_____

Worksheet: Special Right Triangles 45-45-90



Find the lengths of the indicated sides. SHOW ALL WORK.

1.

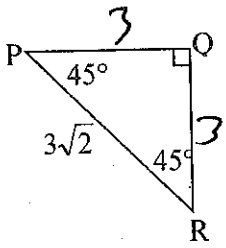


BC = _____

AC = _____

Leg(x)	Leg(x)	Hypotenuse $(x\sqrt{2})$
5	5	$5\sqrt{2}$

2.

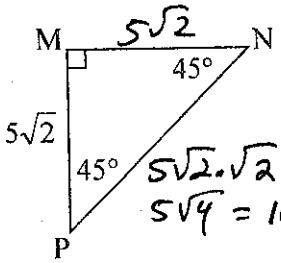


PQ = _____

QR = _____

Leg(x)	Leg(x)	Hypotenuse $(x\sqrt{2})$
3	3	$3\sqrt{2}$

3.



MN = _____

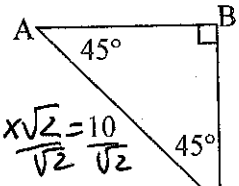
NP = _____

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

$5\sqrt{4} = 10$

Leg(x)	Leg(x)	Hypotenuse $(x\sqrt{2})$
$5\sqrt{2}$	$5\sqrt{2}$	10

4.



AB = _____

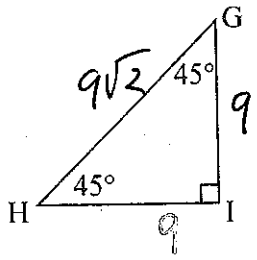
BC = _____

$\frac{x\sqrt{2}}{\sqrt{2}} = \frac{10}{\sqrt{2}}$

$x = \frac{10}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{10\sqrt{2}}{2} = 5\sqrt{2}$

Leg(x)	Leg(x)	Hypotenuse $(x\sqrt{2})$
$5\sqrt{2}$	$5\sqrt{2}$	10

5.

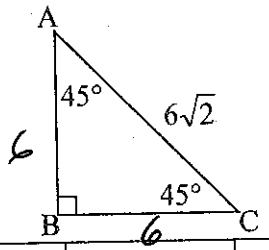


GI = _____

HI = _____

Leg(x)	Leg(x)	Hypotenuse $(x\sqrt{2})$
9	9	$9\sqrt{2}$

6.



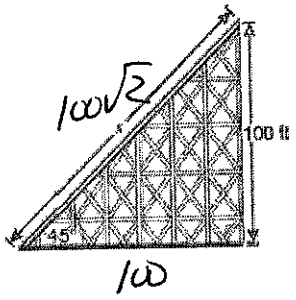
AB = _____

BC = _____

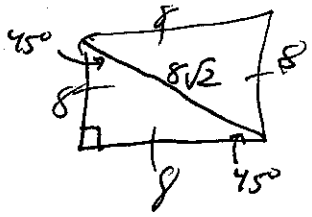
Leg(x)	Leg(x)	Hypotenuse $(x\sqrt{2})$
6	6	$6\sqrt{2}$

7. Matt wants to design the first section of a roller coaster track. He wants the ramp section to rise at 45° with the horizontal and connect at the top of a segment 100 feet high. Find x, the length of the ramp Matt needs to complete his section of the coaster track?

Leg(x)	Leg (x)	Hypotenuse $\left(x\sqrt{2}\right)$
100	100	$100\sqrt{2}$

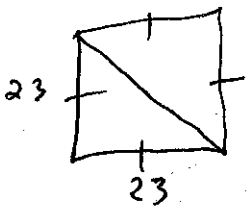


8. A square has a perimeter of 32 inches. How long is the diagonal?



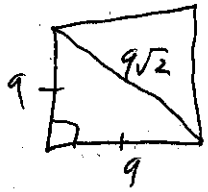
Leg(x)	Leg (x)	Hypotenuse $\left(x\sqrt{2}\right)$
8	8	$8\sqrt{2}$

9. A square has side lengths of 23 inches. How long is each diagonal?



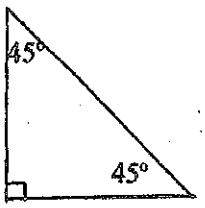
Leg(x)	Leg (x)	Hypotenuse $\left(x\sqrt{2}\right)$
23	23	$23\sqrt{2}$

10. Sam's square bedroom has a diagonal of $9\sqrt{2}$ feet. What is the length of each side?



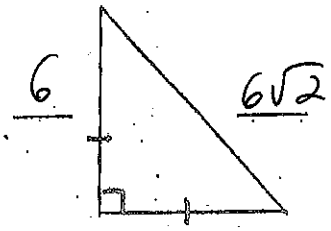
Leg(x)	Leg (x)	Hypotenuse $\left(x\sqrt{2}\right)$
9	9	$9\sqrt{2}$

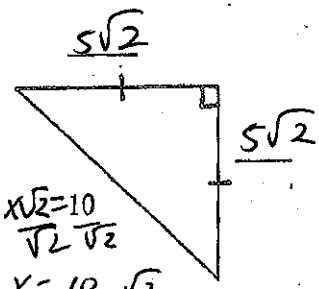
WORKSHEET #2: 45-45-90° TRIANGLES



Hypotenuse = leg * $\sqrt{2}$

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

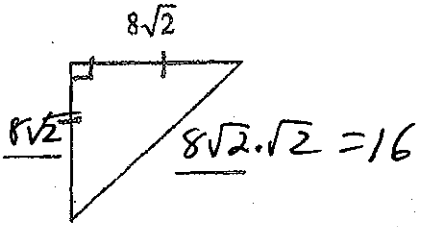


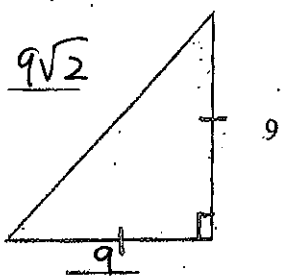


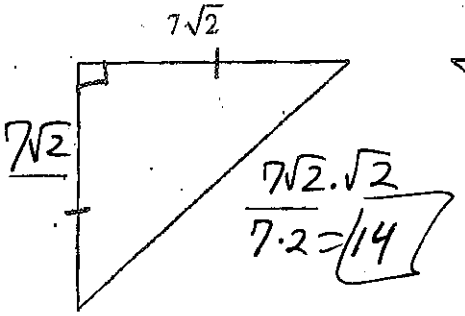
$\frac{x\sqrt{2}}{\sqrt{2}\sqrt{2}} = 10$

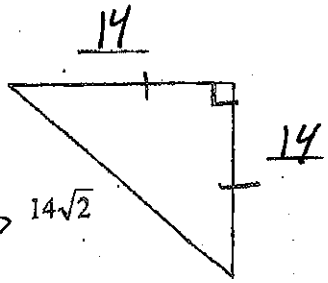
$x = \frac{10}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$

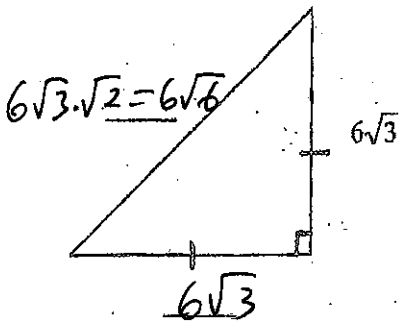
$x = \frac{10\sqrt{2}}{2} = 5\sqrt{2}$

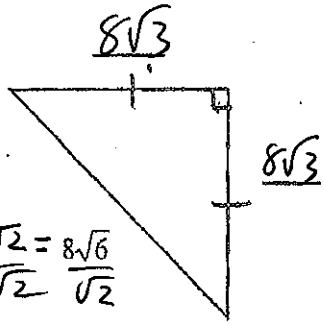






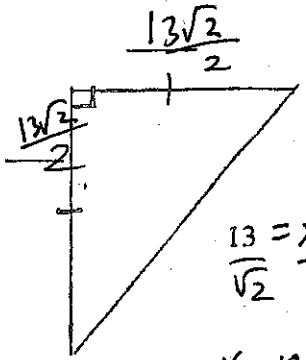






$\frac{x\sqrt{2}}{\sqrt{2}} = \frac{8\sqrt{6}}{\sqrt{2}}$

$x = 8\sqrt{3}$



$\frac{13}{\sqrt{2}} = \frac{x\sqrt{2}}{\sqrt{2}}$

$x = \frac{13}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$

$x = \frac{13\sqrt{2}}{2}$

Notes
ACC Alg/Geo

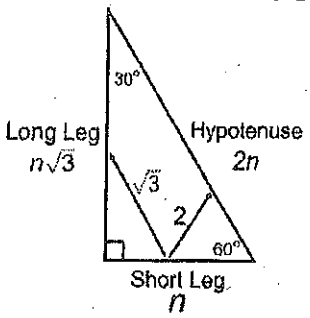
Name: _____

Period: _____

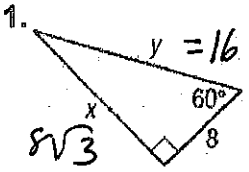
Special Right Triangles: 30° - 60° - 90°

Hypotenuse = 2 * Short Leg

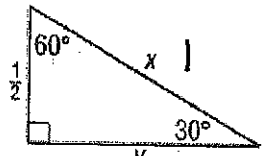
Long Leg = Short Leg * $\sqrt{3}$



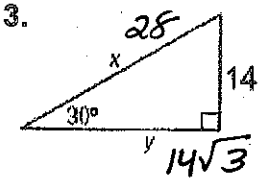
Find the value of x and y in each triangle.

1. 

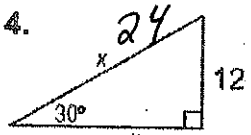
$8\sqrt{3}$

2. 

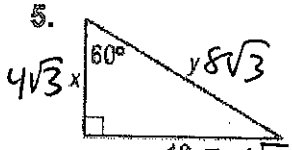
$\frac{1}{2}\sqrt{3}$

3. 

$14\sqrt{3}$

4. 

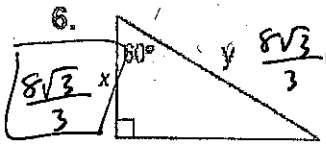
$12\sqrt{3}$

5. 

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

$x = \frac{12}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{12\sqrt{3}}{3}$

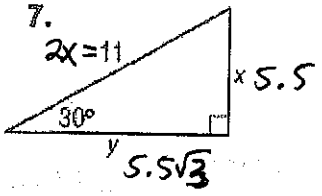
$= 4\sqrt{3}$

6. 

$\frac{8\sqrt{3}}{3}(2) = \frac{16\sqrt{3}}{3}$

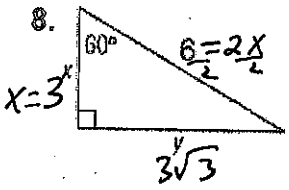
$\frac{8}{\sqrt{3}} = \frac{x\sqrt{3}}{\sqrt{3}}$

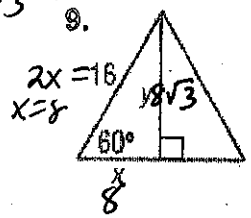
$x = \frac{8}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{8\sqrt{3}}{3}$

7. 

$\frac{2x}{2} = \frac{11}{2}$

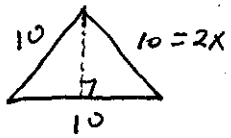
$x = 5.5$

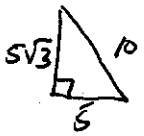
8. 

9. 

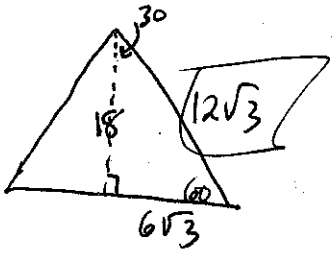
Sketch the figure that is described. Then, find the requested measure.

10. An equilateral triangle has a side length of 10 inches. Find the length of the triangles altitude.





11. The altitude of an equilateral triangle is 18 inches. Find the length of a side.



$\frac{18}{\sqrt{3}} = \frac{x\sqrt{3}}{\sqrt{3}}$

$x = \frac{18}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$

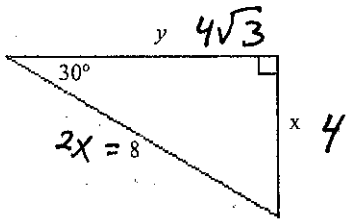
$x = \frac{18\sqrt{3}}{3} = 6\sqrt{3}$

Name: _____ Mixed ReviewVersion A

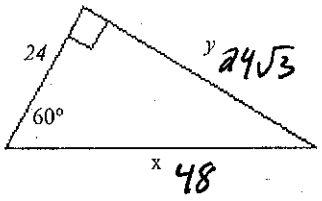
Worksheet 4: Special 30-60-90 Triangles

Find the missing measures. Write all radicals in simplest form.

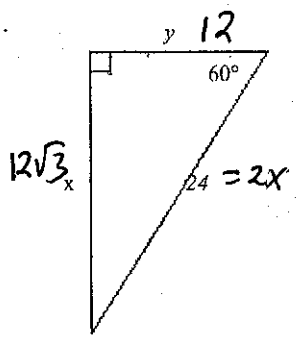
1.



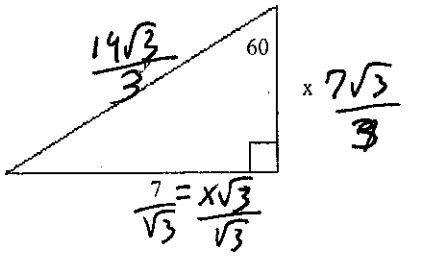
2.



3.

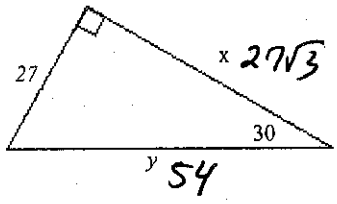


4.

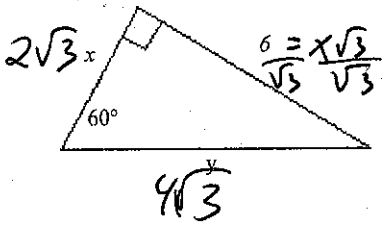


$X = \frac{7}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{7\sqrt{3}}{3}$

5.



6.



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

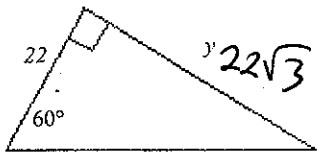
$X = \frac{6\sqrt{3}}{3}$

$X = 2\sqrt{3}$

7. Before going to problem 8 on the reverse side, have your answers checked.

5

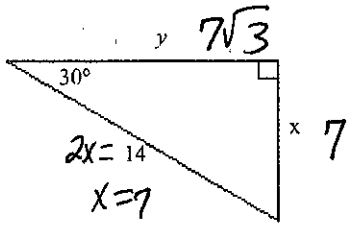
8.



$y = 22\sqrt{3}$

$x = 44$

9.

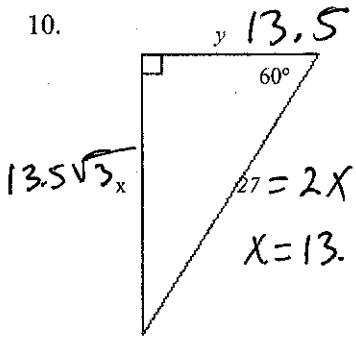


$y = 7\sqrt{3}$

$2x = 14$

$x = 7$

10.

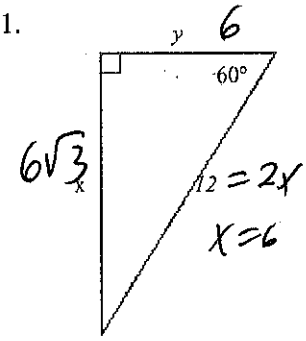


$y = 13.5$

$27 = 2x$

$x = 13.5$

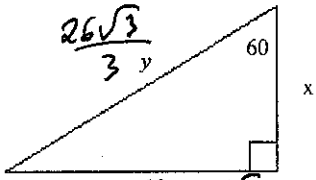
11.



$12 = 2x$

$x = 6$

12.



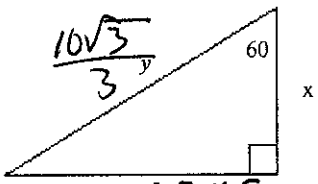
$x = \frac{13\sqrt{3}}{3}$

$\frac{13}{\sqrt{3}} = \frac{x\sqrt{3}}{\sqrt{3}}$

$x = \frac{13}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$

$x = \frac{13\sqrt{3}}{3}$

13.



$\frac{5}{\sqrt{3}} = \frac{x\sqrt{3}}{\sqrt{3}}$

$x = \frac{5}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$

$x = \frac{5\sqrt{3}}{3}$

6

Acc. Alg/Geo A - Right Triangle Trig Extra Practice

smiles when_____

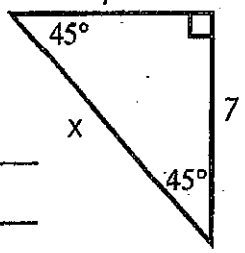
Period:_____ Date:_____

1 – 4: Fill in the following table. (6 pts)

30-60-90	Δ#1	Δ#2	Δ#3
Length of small side	8	$\sqrt{5}$	10
Length of longer side	$8\sqrt{3}$	$\sqrt{15}$	$10\sqrt{3}$
Hypotenuse	16	$2\sqrt{5}$	20

Find the missing measures. Write all radicals in simplest form. (2 pts each)

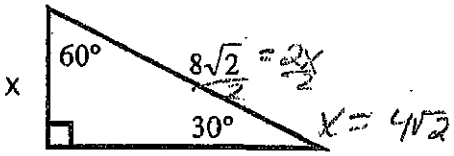
5.



x= $7\sqrt{2}$

y = 7

6.



x = $4\sqrt{2}$

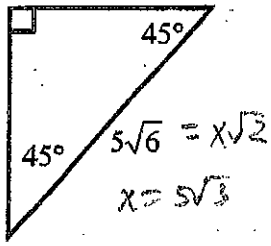
y = $4\sqrt{6}$

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

$x = 4\sqrt{2}$

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

7.



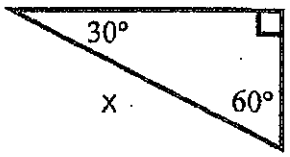
X= $5\sqrt{3}$

y = $5\sqrt{3}$

$5\sqrt{6} = x\sqrt{2}$

$x = 5\sqrt{3}$

8.



x = $2\sqrt{3}$

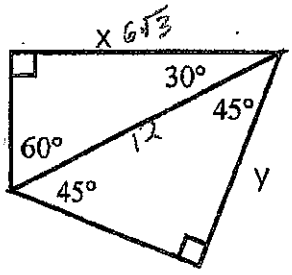
y = $4\sqrt{3}$

$6 = x\sqrt{3}$

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

$2\sqrt{3}$

9.



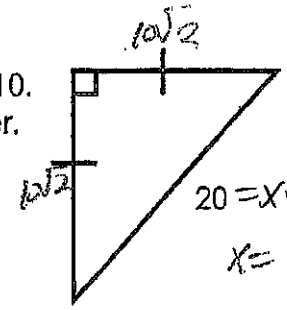
X= $6\sqrt{3}$

y = $6\sqrt{2}$

$x\sqrt{2} = 12$

$x = \frac{12\sqrt{2}}{2}$

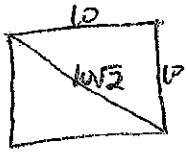
10. Find the perimeter.



$20\sqrt{2} + 20$

$x = 10\sqrt{2}$

11. The diagonal of a square is $10\sqrt{2}$ in. Find the area of the square. (2pts)

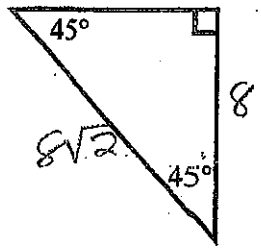


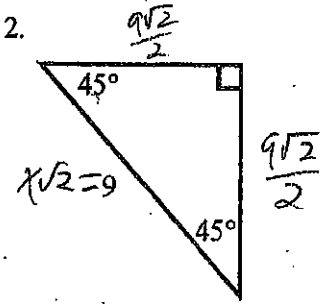
$A = 100\ in^2$

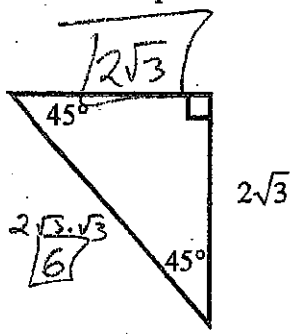
(4) (26)

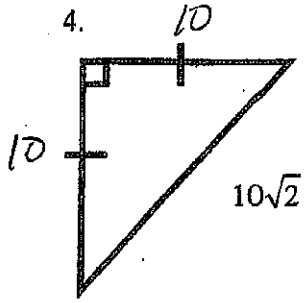
M

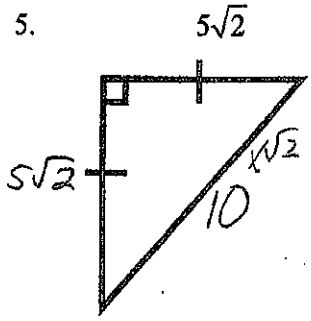
Label all the sides of the special right triangles. Put all answers in simplified radical Form.

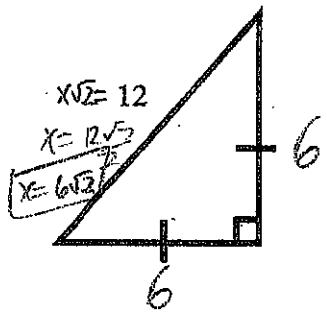
1. 

2. 

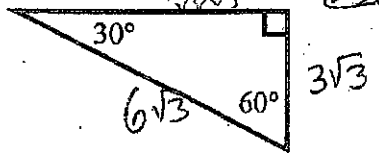
3. 

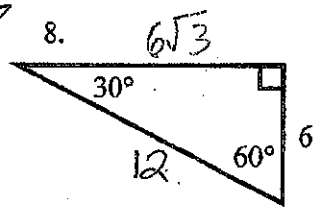
4. 

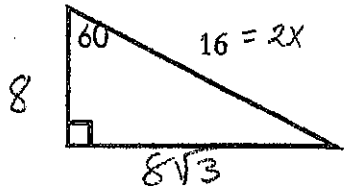
5. 

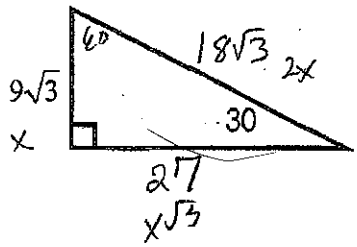
6. 

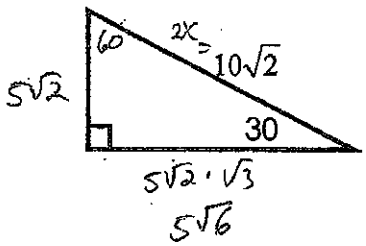
7. x√3 = 9√3/√3 = 9√3/3 = 3√3



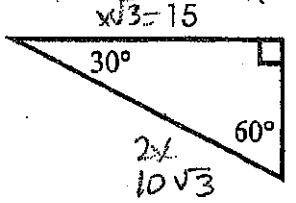
8. 

9. 

10. 

11. 

12. x= 15/√3 · √3/√3 = 5√3



18 27

8

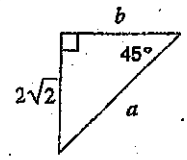
Kuta Software - Infinite Geometry Name_____

Special Right Triangles

Date_____ Period____

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

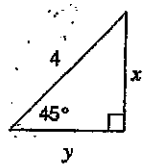
1)



$a = 4$

$b = 2\sqrt{2}$

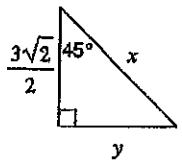
2)



$x = 2\sqrt{2}$

$y = 2\sqrt{2}$

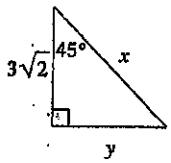
3)



$x = 3$

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

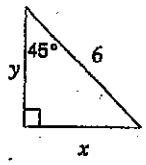
4)



$x = 6$

$y = 3\sqrt{2}$

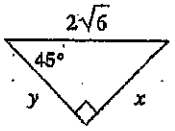
5)



$x = 3\sqrt{2}$

$y = 3\sqrt{2}$

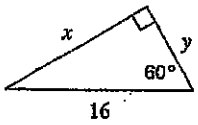
6)



$x = 2\sqrt{3}$

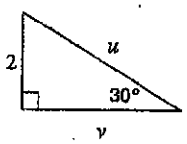
$y = 2\sqrt{3}$

7)



$x = 8\sqrt{3}$ ~~$y = 8$~~

8)

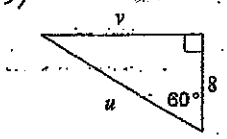


$u = 4$

$v = 2\sqrt{3}$

9

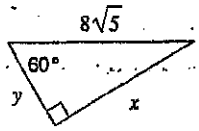
9)



$u = 16$

$v = 8\sqrt{3}$

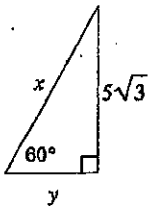
10)



$x = 4\sqrt{15}$

$y = 4\sqrt{5}$

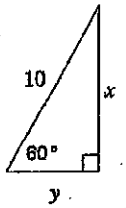
11)



$x = 10$

$y = 5$

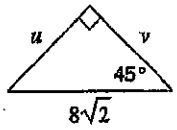
12)



$x = 5\sqrt{3}$

$y = 5$

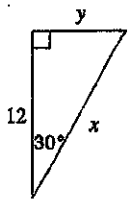
13)



$u = 8$

$v = 8$

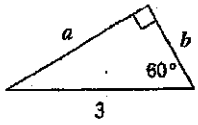
14)



$x = 8\sqrt{3}$

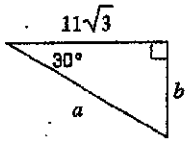
$y = 4\sqrt{3}$

15)



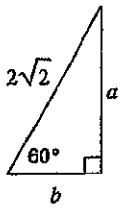
$a = \frac{3\sqrt{3}}{2}$ $b = 3/2$

16)



$a = 22$ $b = 11$

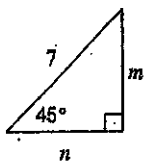
17)



$a = \sqrt{6}$

$b = \sqrt{2}$

18)



$m = \frac{7\sqrt{2}}{2}$ $n = \frac{7\sqrt{2}}{2}$

10

29

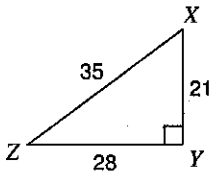
 Name_____

Trigonometric Ratios

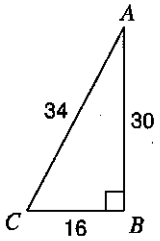
Date_____ Period____

Find the value of each trigonometric ratio.

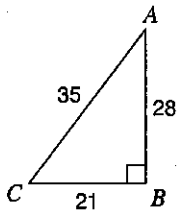
1) tan Z $\frac{3}{4}$



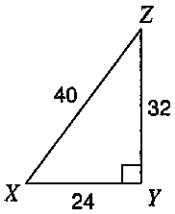
2) cos C $\frac{8}{17}$



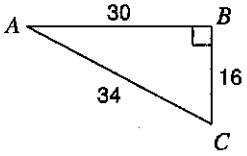
3) sin C $\frac{4}{5}$



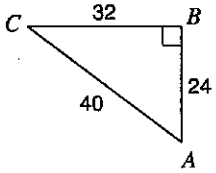
4) tan X $\frac{4}{3}$



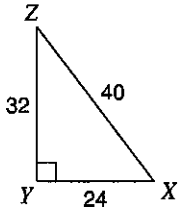
5) cos A $\frac{15}{17}$



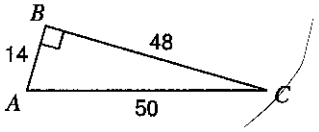
6) sin A $\frac{4}{5}$



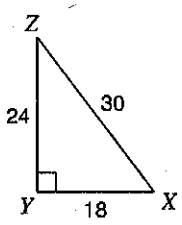
7) sin Z $\frac{3}{5}$



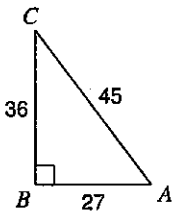
8) sin C $\frac{7}{25}$



9) cos Z $\frac{4}{5}$

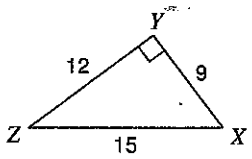


10) tan C $\frac{3}{4}$



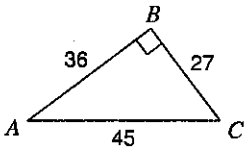
Find the value of each trigonometric ratio to the nearest ten-thousandth.

11) cos Z



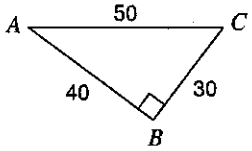
0.8000

12) cos C



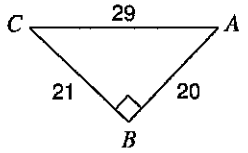
0.6000

13) tan C



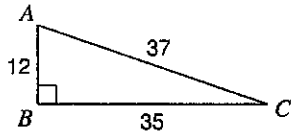
1.3333

14) tan A



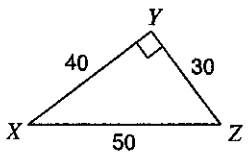
1.0500

15) tan C



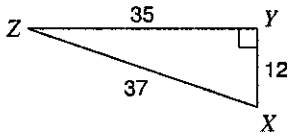
0.3429

16) tan X



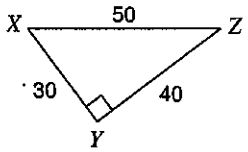
0.7500

17) sin Z



0.3243

18) sin Z



0.6000

19) sin 48°

0.7431

20) sin 38°

0.6157

21) cos 61°

0.4848

22) cos 51°

0.6293

Critical thinking questions:

23) Can the sine of an angle ever equal 2? Why or why not?

No, the hypotenuse > opposite side.

24) $\sin x = \frac{1}{3}$

Find cos x.

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

14

Kuta Software - Infinite Geometry

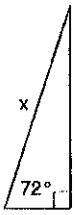
Name KEY

Solving Right Triangles * Make sure your calculator is set to degree (not radian)

Date _____ Period ____

Find the missing side. Round to the nearest tenth.

1)



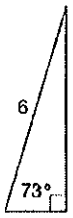
19.4

$\cos 72 = \frac{6}{x}$

$x = \frac{6}{\cos 72}$

$x \approx 19.4$

2)



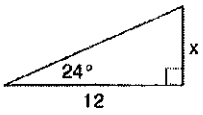
1.8

$\cos 73 = \frac{x}{6}$

$6 \cdot \cos 73 = x$

$x \approx 1.8$

3)



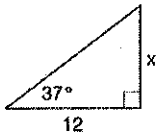
5.3

$\tan 24 = \frac{x}{12}$

$12 \cdot \tan 24 = x$

$x \approx 5.3$

4)



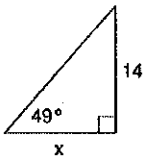
9.0

$\tan 37 = \frac{x}{12}$

$x = 12 \cdot \tan 37$

$x \approx 9.0$

5)



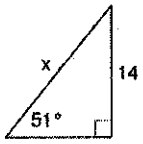
12.2

$\tan 49 = \frac{14}{x}$

$x = 14 / \tan 49$

$x \approx 12.2$

6)

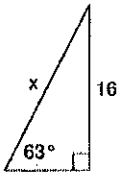


18.0

$\sin 51 = \frac{14}{x}$

$x = \frac{14}{\sin 51}$ $x \approx 18.0$

7)



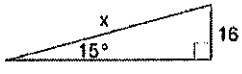
18.0

$\sin 63 = \frac{16}{x}$

$x = \frac{16}{\sin 63}$

$x \approx 18.0$

8)

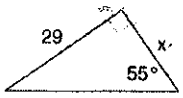


61.8

$\sin 15 = \frac{16}{x}$

$x = \frac{16}{\sin 15}$ $x \approx 61.8$

16

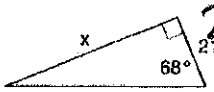
9) 

20.3

$\tan 55 = \frac{29}{x}$

$x = \frac{29}{\tan 55}$

$x \approx 20.3$

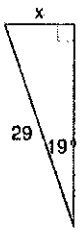
10) 

52.0

$21 \cdot \tan 68 = \frac{x}{21} \cdot \frac{21}{1}$

$x = 21 \cdot \tan 68$

$x \approx 52.0$

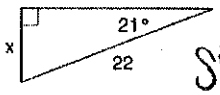
11) 

9.4

$\sin 19 = \frac{x}{29}$

$x = 29 \cdot \sin 19$

$x \approx 9.4$

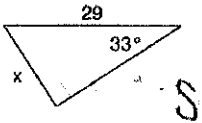
12) 

7.9

$\sin 21 = \frac{x}{22}$

$x = 22 \cdot \sin 21$

$x \approx 7.9$

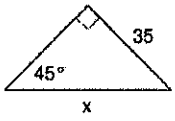
13) 

15.8

$\sin 33 = \frac{x}{29}$

$x = 29 \cdot \sin 33$

$x \approx 15.8$

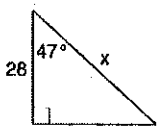
14) 

49.5

$\sin 45 = \frac{35}{x}$

$x = 35 / \sin 45$

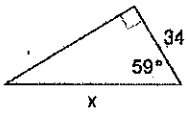
$x \approx 49.5$

15) 

41.1

$\cos 47 = \frac{28}{x}$

$x = \frac{28}{\cos 47}$ $x \approx 41.1$

16) 

66.0

$\cos 59 = \frac{34}{x}$

$x = \frac{34}{\cos 59}$ $x \approx 66.0$

Critical thinking question:

17) Write a new problem that is similar to the others on this worksheet. Solve the question you wrote.

SKIP

Many answers.

17

Kuta Software - Infinite Geometry

Name Key

Inverse Trigonometric Ratios

Date _____ Period ____

Find each angle measure to the nearest degree.

1) $\sin B = 0.4848$ $\approx 28.99^\circ$ $= 29$

2) $\sin A = 0.5150$ $\approx 30.9^\circ$ $= 31$

3) $\cos A = 0.7431$ $\approx 42^\circ$

4) $\cos W = 0.6157$ $\approx 51.9^\circ$ 52°

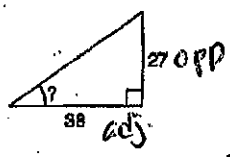
5) $\cos A = 0.5878$ $\approx 53.9^\circ$ 54°

6) $\tan W = 19.0811$ $\approx 86.9^\circ$ 87°

7) $\cos A = 0.4226$ $\approx 65^\circ$

8) $\tan W = 0.5317$ $\approx 27.9^\circ$ 28°

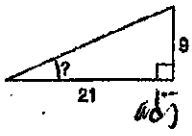
Find the measure of the indicated angle to the nearest degree.

9) 

$\tan\theta = \frac{27}{38}$

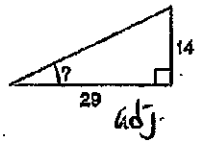
$\tan^{-1}(27/38)$

$\theta \approx 35.4^\circ$

10) 

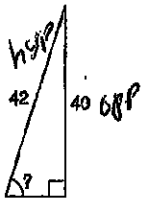
$\tan^{-1}(9/21)$

$\theta \approx 23.2^\circ$

11) 

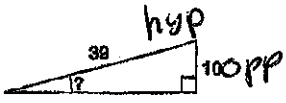
$\tan^{-1}\theta = 14/29$

$\theta \approx 25.7^\circ$

12) 

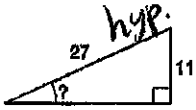
$\sin^{-1}(40/42)$

$\theta \approx 72.2^\circ$

13) 

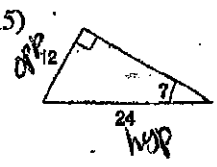
$\sin\theta = \frac{10}{39}$

$\theta \approx 14.9^\circ$

14) 

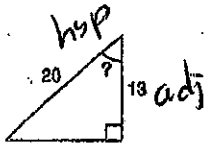
$\sin^{-1}(11/27)$

$\theta \approx 24^\circ$

15) 

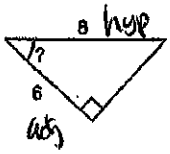
$\sin^{-1}(12/24)$

$\theta = 30°$

16) 

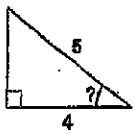
$\cos^{-1}(13/20)$

$\theta \simeq 49°$

17) 

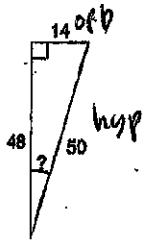
$\cos^{-1}(6/8)$

$\theta \simeq 41°$

18) 

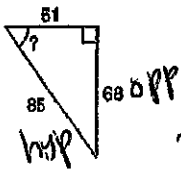
$\cos^{-1}(4/5)$

$\theta \simeq 37°$

19) 

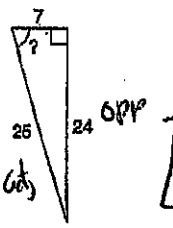
$\sin^{-1}(14/50)$

$\theta \simeq 16°$

20) 

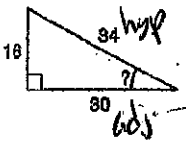
$\sin^{-1}(68/85)$

$\theta \simeq 53°$

21) 

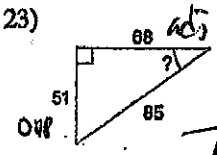
$\sin^{-1}(24/25)$

$\theta \simeq 74°$

22) 

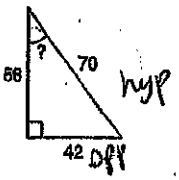
$\cos^{-1}(30/34)$

$\theta \simeq 28°$

23) 

$\tan^{-1}(51/68)$

$\theta \simeq 37°$

24) 

$\sin^{-1}(42/70)$

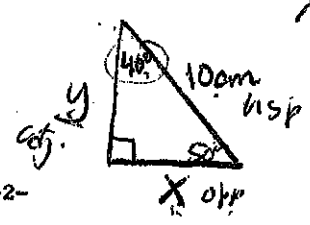
~~$\theta \simeq 38.3$~~

$\theta \simeq 37°$

Critical thinking questions:

25) Find an angle x where $\sin x = \cos x$.

26) Draw and label all three sides of a right triangle that has a 40° angle and a hypotenuse of 10 cm.



$10 \cdot \sin 40 = \frac{x}{10} \cdot 10$

$x = 10 \sin 40$

$x \simeq 6.4$ cm

$10 \cdot \cos 40 = \frac{y}{10} \cdot 10$

$y = 10 \cos 40 \simeq 7.7$ cm

Right Triangle Problems
For use after Lesson 14-4

NAME _____

DATE _____

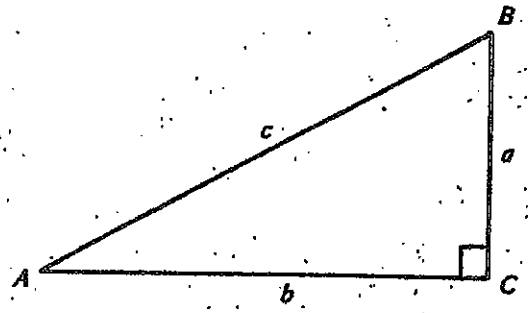
Hidden Message

1. Work each exercise.
2. Shade in the block that contains the answer.
3. Read the message in the unshaded blocks.

Exercises

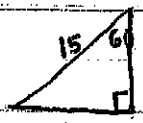
Find angles to the nearest degree. Find sides to the nearest tenth.

1. $\angle A = 40°, b = 10, a = ?$ 8.4
2. $\angle B = 60°, c = 15, b = ?$
3. $b = 4.908, c = 5, \angle A = ?$
4. $a = 1.710, c = 5, \angle B = ?$
5. $a = 1.4, b = 2, \angle A = ?$
6. $\angle A = 34°, c = 100, b = ?$
7. $\angle B = 53°, c = 10, a = ?$
8. $\angle A = 25°, c = 12, a = ?$
9. $\angle B = 45°, a = 16, b = ?$
10. $a = 3, c = 5, \angle A = ?$
11. $a = 4, b = 9, \angle A = ?$
12. $\angle B = 70°, b = 93.9, c = ?$
13. $\angle B = 51°, b = 8, c = ?$
14. $\angle A = 14°, a = 11, c = ?$
15. $a = 40, b = 40$ [illegible]
16. [illegible] $16.18, c = 20, \angle A = ?$



D 66°	O 45°	T 8.4	H 5.1	E 11°
H 100.0	O 10	U 16.0	R 83	E 37°
I 70°	T 45.5	N 5.2	O 36°	W 13
N 35°	I 10.3	C 6.0	E 79°	R 24°

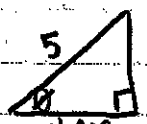
page 12

2. 

$\sin 60 = \frac{b}{15}$

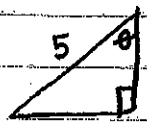
$b = 15 \cdot \sin 60$

$\boxed{b = 13}$

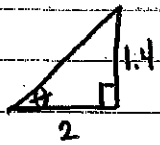
3. 

$(\cos^{-1})\ \cos\theta = \frac{4.908}{5}$ $\quad \cos^{-1}$

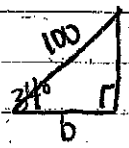
$\boxed{\theta = 11.0°}$

4. 

$\cos^{-1}\ \cos\theta = \frac{1.710}{5}$ $\quad \cos^{-1}$ $\quad \boxed{\theta \approx 70°}$

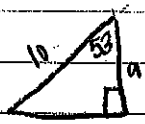
5. 

$\tan^{-1}\ \tan\theta = \frac{1.4}{2}$ $\quad \tan^{-1}$ $\quad \boxed{\theta \approx 35°}$

6. 

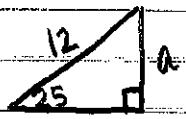
$\cos 34 = \frac{b}{100}$

$b = 100 \cdot \cos 34$ $\quad \boxed{b = 82.9}$

7. 

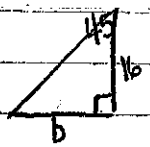
$\cos 53 = \frac{a}{10}$ $\quad a = 10 \cdot \cos 53$

$\boxed{a = 6.0}$

8. 

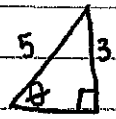
$\sin 25 = \frac{a}{12}$ $\quad a = 12 \cdot \sin 25$

$\boxed{a = 5.1}$

9. 

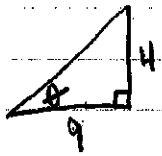
$\tan 45 = \frac{b}{16}$ $\quad b = 16 \cdot \tan 45$

$\boxed{b = 16}$

10. 

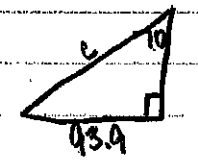
$\sin^{-1}\ \sin\theta = \frac{3}{5}$ $\quad \sin^{-1}$ $\quad \boxed{\theta = 36.9°}$

back →

11. 

$\tan^{-1}$ $\tan\theta = \frac{4}{9}$ $\tan^{-1}$

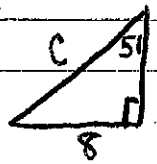
$\theta = 24.0°$

12. 

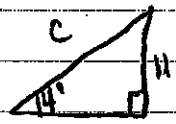
$\sin 70 = \frac{93.9}{c}$

$c = \frac{93.9}{\sin 70}$

$c = 100$

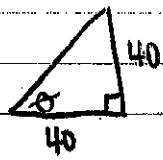
13. 

$\sin 51 = \frac{8}{c}$ $c = \frac{8}{\sin 51}$ $c = 10.3$

14. 

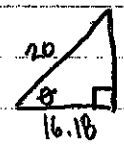
$\sin 14 = \frac{11}{c}$ $c = \frac{11}{\sin 14}$

$c = 45.5$

15. 

$\tan^{-1}$ $\tan\theta = \frac{40}{40}$ $\tan^{-1}$

$\theta = 45°$

16. 

$\cos^{-1}$ $\cos\theta = \frac{16.18}{20}$ $\cos^{-1}$

$\theta = 36.0°$

Mr. Bone