

Name:

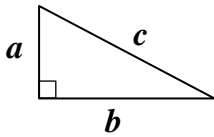
Date:

Topic:

Class:

Main Ideas/Questions	Notes/Examples
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PYTHAGOREAN THEOREM



- Used to find the missing sides of a right triangle.
- Sides a and b are called legs.
- Side c is called the hypotenuse (hyp).
- For any right triangle: $a^2 + b^2 = c^2$
Legs hyp

Examples

Directions: Find the value of x . Round each answer to the nearest tenth.

1. $a^2 + b^2 = c^2$
 $8^2 + 13^2 = x^2$
 $64 + 169 = x^2$
 $233 = x^2$
 $\sqrt{233} = x$
 $15.26 = x$

2.

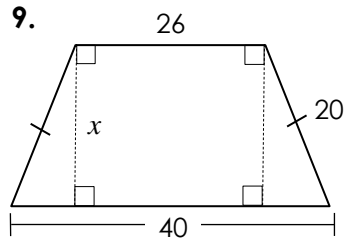
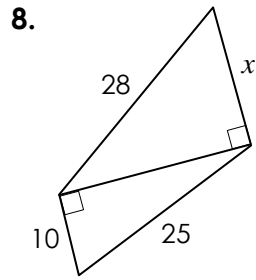
3. $a^2 + b^2 = c^2$
 $7^2 + x^2 = 9^2$
 $49 + x^2 = 81$
 -49
 $x^2 = 32$
 $x = 5.7$

4.

5.

6.

7.



APPLICATIONS

Directions: Draw a picture, then solve for the missing side.

10. A roofer leaned a 16-foot ladder against a house. If the base of the ladder is 5 feet from the house, how high up the house does the ladder reach?

11. Kurt is building a rectangular deck. If the dimensions of the deck are 10 feet by 23 feet, what is the length of the diagonal of the deck?

12. Ashley jogged 3.4 miles east, then 5.7 miles south. How far is Ashley from her starting point?

13. A 31-foot support wire is attached from the top of a 25 foot telephone pole to a point on the ground. How far from the base of the pole does the wire meet the ground?

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Main Ideas/Questions

Notes/Examples

45°-45°-90°
Special Right Triangle

Leg = X *Legs SAME*
Hypotenuse = $X\sqrt{2}$
leg $\cdot \sqrt{2}$

Note: The legs of a 45°-45°-90° triangle are always congruent.

Directions: Find the value of each variable.

1.

$x = \underline{8}$
 $y = \underline{8\sqrt{2}}$

2.

$x = \underline{25\sqrt{2}}$
 $y = \underline{25}$

3.

$x = \underline{\frac{19}{\sqrt{2}}}$
 $y = \underline{\frac{19}{\sqrt{2}}}$

30°-60°-90°
Special Right Triangle

Think 3's stick together!

Shorter Leg = X
Longer Leg = $X\sqrt{3}$
Hypotenuse = $2X$

Note: The shorter leg is always opposite the 30° angle and the longer leg is always opposite the 60° angle.

Directions: Find the value of each variable.

4.

$x = \underline{5\sqrt{3}}$
 $y = \underline{10}$

5.

$x = \underline{28}$
 $y = \underline{14\sqrt{3}}$

6.

$x = \underline{16}$
 $y = \underline{16\sqrt{3}}$

7.

$x = \underline{\hspace{2cm}}$
 $y = \underline{\hspace{2cm}}$

8.

$x = \underline{\hspace{2cm}}$
 $y = \underline{\hspace{2cm}}$

9.

$x = \underline{\hspace{2cm}}$
 $y = \underline{\hspace{2cm}}$

MIXED PRACTICE! Find the value of each variable.

10.

$x =$ _____
 $y =$ _____

11.

$x =$ _____
 $y =$ _____

12.

$x =$ _____
 $y =$ _____

13.

$x =$ _____
 $y =$ _____

14.

$x =$ _____
 $y =$ _____

15.

$x =$ _____
 $y =$ _____

16.

$x =$ _____
 $y =$ _____

17.

$x =$ _____
 $y =$ _____

18.

$x =$ _____
 $y =$ _____

19.

$x =$ _____
 $y =$ _____
 $z =$ _____

20.

$x =$ _____
 $y =$ _____
 $z =$ _____

21.

$x =$ _____
 $y =$ _____
 $z =$ _____

22.

$x =$ _____
 $y =$ _____
 $z =$ _____

23.

$x =$ _____
 $y =$ _____
 $z =$ _____

24.

$x =$ _____
 $y =$ _____
 $z =$ _____

Name: _____

Unit 7: Right Triangles & Trigonometry

Date: _____ Per: _____

Homework 2: Special Right Triangles



**** This is a 2-page document! ****

Directions: Find the value of each variable.

1.

$x =$ _____
 $y =$ _____

2.

$x =$ _____
 $y =$ _____

3.

$x =$ _____
 $y =$ _____

4.

$x =$ _____
 $y =$ _____

5.

$x =$ _____
 $y =$ _____

6.

$x =$ _____
 $y =$ _____

7.

$x =$ _____
 $y =$ _____

8.

$x =$ _____
 $y =$ _____

9.

$x =$ _____
 $y =$ _____

10.

$x =$ _____
 $y =$ _____

11.

$x =$ _____
 $y =$ _____

12.

$x =$ _____
 $y =$ _____

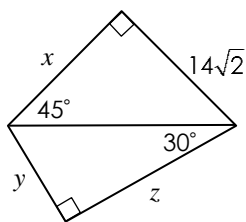
13.

$x =$ _____
 $y =$ _____
 $z =$ _____

14.

$x =$ _____
 $y =$ _____
 $z =$ _____

15.

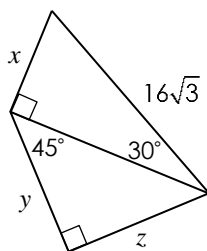


$x =$ _____

$y =$ _____

$z =$ _____

16.

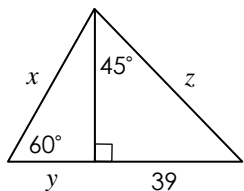


$x =$ _____

$y =$ _____

$z =$ _____

17.

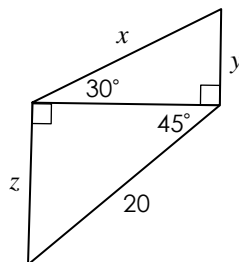


$x =$ _____

$y =$ _____

$z =$ _____

18.

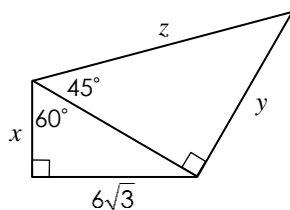


$x =$ _____

$y =$ _____

$z =$ _____

19.

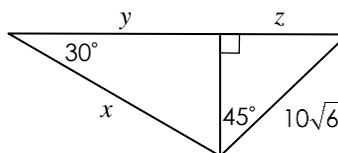


$x =$ _____

$y =$ _____

$z =$ _____

20.

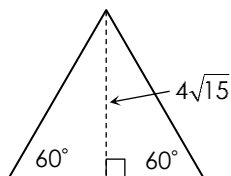


$x =$ _____

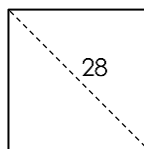
$y =$ _____

$z =$ _____

21. Find the perimeter of the triangle:



22. Find the perimeter of the square:



23. Steel loading ramps are used to load a lawn mower onto a truckbed 37.5 inches above ground. If the ramps make a 30° angle with the ground, find the length of the ramps in feet.

24. The infield of a baseball field is a square with sides measuring 90 feet. A ball thrown from third to first base is caught in 1.2 seconds. Find the speed of the ball in feet per second. Round to the nearest tenth.

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Main Ideas/Questions **Notes/Examples**

What is
TRIGONOMETRY?

the study of triangle measurement

TRIGONOMETRIC RATIOS

Each acute angle of a right triangle has the following trigonometric ratios:

SINE	The ratio of the leg opposite the angle to the hypotenuse .	<ul style="list-style-type: none"> • $\sin A = \frac{\text{opp}}{\text{hyp}}$ • $\sin B = \frac{\text{opp}}{\text{hyp}}$
COSINE	The ratio of the leg adjacent to the angle to the hypotenuse .	<ul style="list-style-type: none"> • $\cos A = \frac{\text{adj}}{\text{hyp}}$ • $\cos B = \frac{\text{adj}}{\text{hyp}}$
TANGENT	The ratio of the leg opposite the angle to the leg adjacent to the angle.	<ul style="list-style-type: none"> • $\tan A = \frac{\text{opp}}{\text{adj}}$ • $\tan B = \frac{\text{opp}}{\text{adj}}$

*** REMEMBER!! ***

SOH CAH TOA

$\sin = \frac{\text{opp}}{\text{hyp}}$

$\cos = \frac{\text{adj}}{\text{hyp}}$

$\tan = \frac{\text{opp}}{\text{adj}}$

EXAMPLES

Directions: Give each trigonometric ratio as a fraction in simplest form.

1.
SOH

- $\sin A = \frac{5}{13}$

CAH

- $\cos A = \frac{12}{13}$

TOA

- $\tan A = \frac{5}{12}$

- $\sin C = \frac{12}{13}$
- $\cos C = \frac{5}{13}$
- $\tan C = \frac{12}{5}$

2.

- $\sin W = \frac{12}{13}$
- $\cos W = \frac{9}{13}$
- $\tan W = \frac{12}{9}$

- $\sin X = \frac{9}{13}$
- $\cos X = \frac{12}{13}$
- $\tan X = \frac{9}{12}$

3.

- $\sin L = \frac{16}{34}$
- $\cos L = \frac{30}{34}$
- $\tan L = \frac{16}{30}$

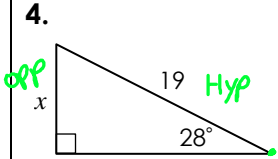
- $\sin M = \frac{30}{34}$
- $\cos M = \frac{16}{34}$
- $\tan M = \frac{30}{16}$

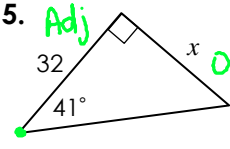
FINDING SIDE LENGTHS

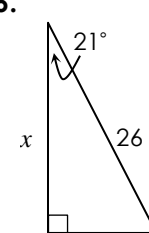
using Trig

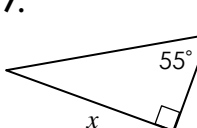
Note: Make sure your calculator is in **degree mode!**

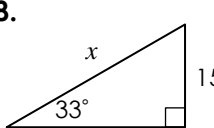
Directions: Solve for x . Round to the nearest tenth.

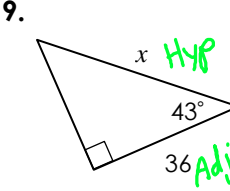
4.  SOH CAH TOA
 $\sin 28 = \frac{x}{19}$
 $19(\sin 28) = \frac{x}{19} \cdot 19$
 $8.9 = x$

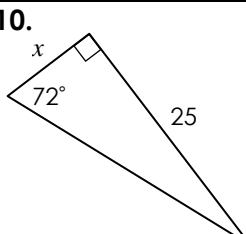
5.  SOH CAH TOA
 $32(\tan 41) = \frac{x}{32} \cdot 32$
 $27.8 = x$

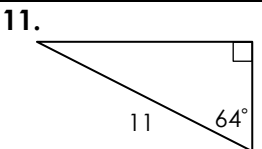
6. 

7. 

8. 

9.  SOH CAH TOA
 $x(\cos 43) = \frac{36}{x} \cdot x$
 $x \cos 43 = 36$
 $\frac{x}{\cos 43} = \frac{36}{\cos 43}$
 $x = 49.2$
 This is the same as $\frac{.7314x}{.7314} = \frac{36}{.7314}$

10. 

11. 

12. Jake leaned a 12-foot ladder against his house. If the angle formed by the ladder and the ground is 68° , how far from the base of the house did he place the ladder?

13. A ramp is used to load suitcases on an airplane. If the cargo door is 7 feet from the ground and the angle formed by the end of the ramp and the ground is 25° , how long is the ramp?

Name: _____

Unit 7: Right Triangles & Trigonometry

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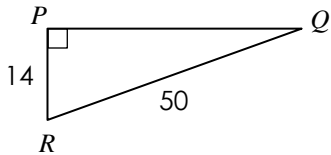
Homework 4: Trigonometric Ratios & Finding Missing Sides



**** This is a 2-page document! ****

Directions: Give each trig ratio as a fraction in simplest form.

1.



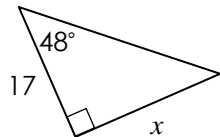
• $\sin Q = \underline{\hspace{2cm}}$ • $\sin R = \underline{\hspace{2cm}}$

• $\cos Q = \underline{\hspace{2cm}}$ • $\cos R = \underline{\hspace{2cm}}$

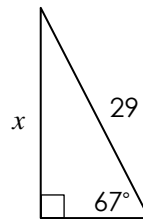
• $\tan Q = \underline{\hspace{2cm}}$ • $\tan R = \underline{\hspace{2cm}}$

Directions: Solve for x . Round to the nearest tenth.

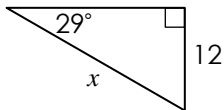
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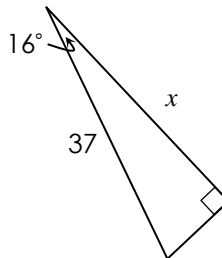
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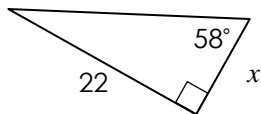
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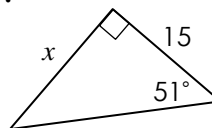
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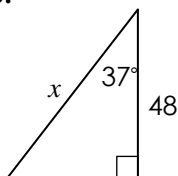
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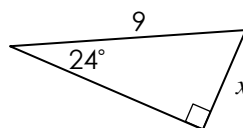
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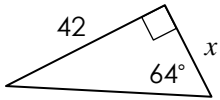
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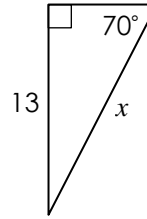
9.



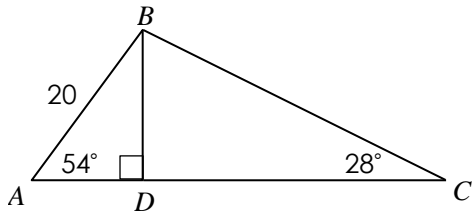
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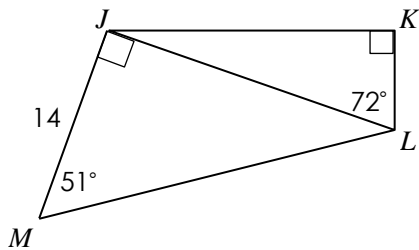
11.



12. Find DC .



13. Find KL .



14. A wire is attached from the top of a 30-foot tall telephone pole to a stake in the ground. If the angle formed by the wire and the pole is 48° , what is the length of the wire?

15. An airplane climbs at an angle of 12° with the ground. Find the horizontal distance it has traveled once it has reached an altitude of 500 feet.

Name:

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Main Ideas/Questions

Notes/Examples

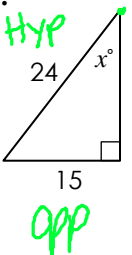
FINDING ANGLE MEASURES

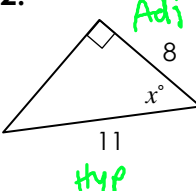
using Trig

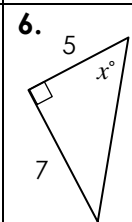
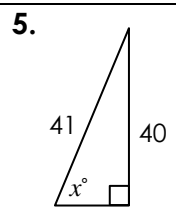
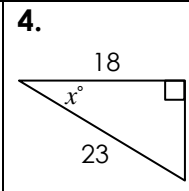
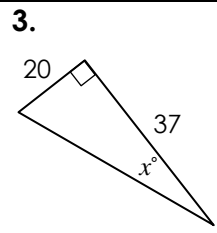
Note: Make sure your calculator is in **degree mode!**

If you know the sine, cosine, or tangent ratio of an angle, you can use the inverse of the ratio (\sin^{-1} , \cos^{-1} , \tan^{-1}) to find the measure of the angle.

Directions: Find the value of x . Round to the nearest tenth.

1.  $\sin X = \frac{15}{24}$
 $\sin^{-1}\left(\frac{15}{24}\right) = 38.7^\circ$
 SOH CAH TOA

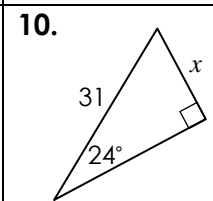
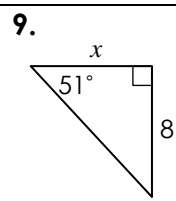
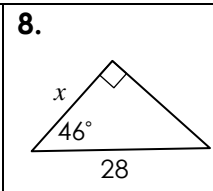
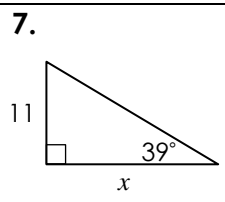
2.  $\cos^{-1}\left(\frac{8}{11}\right) = 43.3^\circ$
 SOH CAH TOA



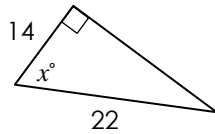
Directions: Find the value of x . Round to the nearest tenth.

REVIEW:

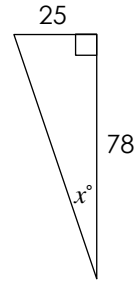
Sides & Angles



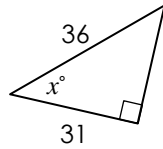
11.



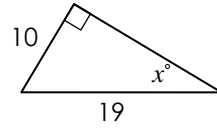
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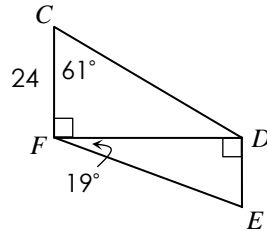
13.



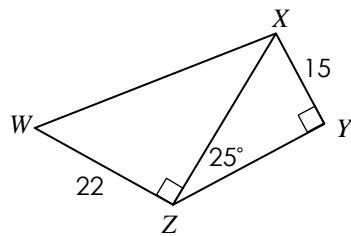
14.



15. Find DE .



16. Find $m\angle W$.

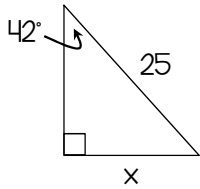


APPLICATIONS

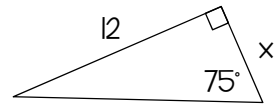
17. A ladder leaning against a wall makes an angle of 75° with the ground. If the foot of the ladder is 6 feet from the base of the wall, what is the length of the ladder?

18. Jaden is flying a kite and lets off 275 feet of string. If the kite is 150 feet above ground and assuming the string is straight, what angle does the string make with the ground?

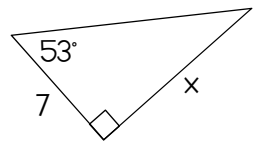
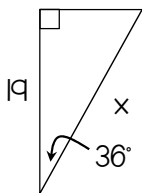
EXAMPLE 1



EXAMPLE 2



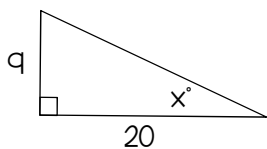
Finding missing
SIDES with
TRIGONOMETRY



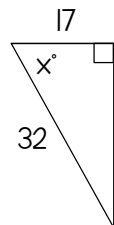
EXAMPLE 3

EXAMPLE 4

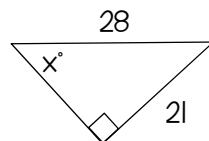
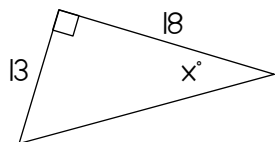
EXAMPLE 1



EXAMPLE 2



Finding missing
ANGLES with
TRIGONOMETRY



EXAMPLE 3

EXAMPLE 4

Name: _____

Unit 7: Right Triangles & Trigonometry

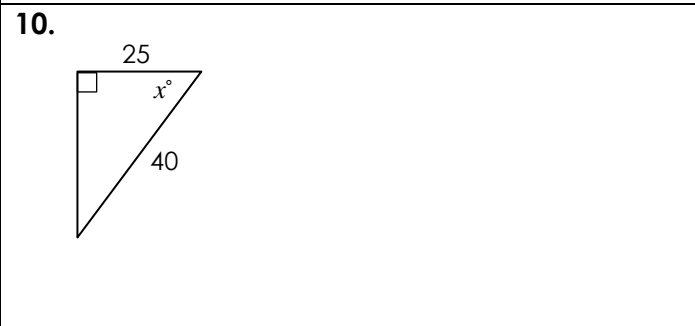
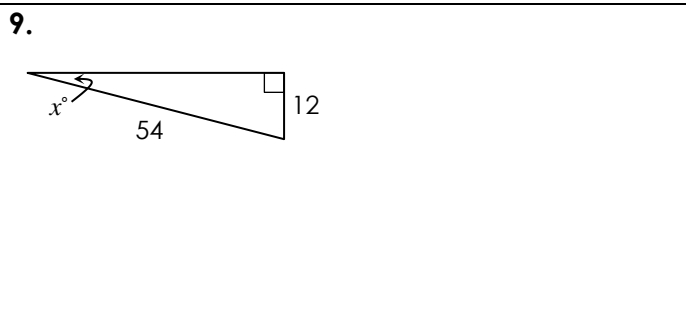
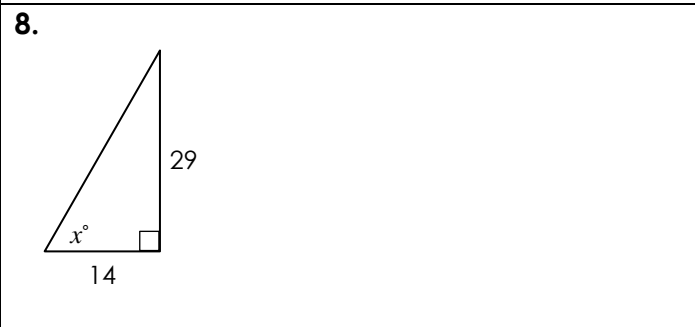
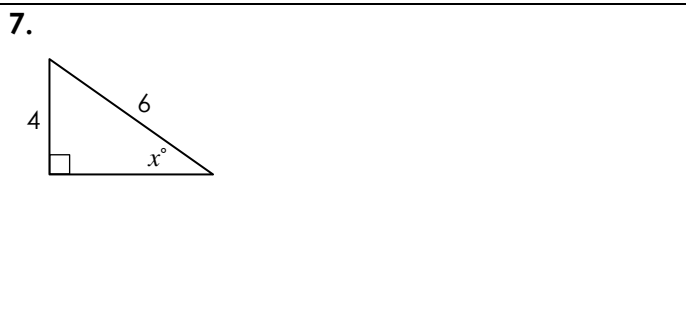
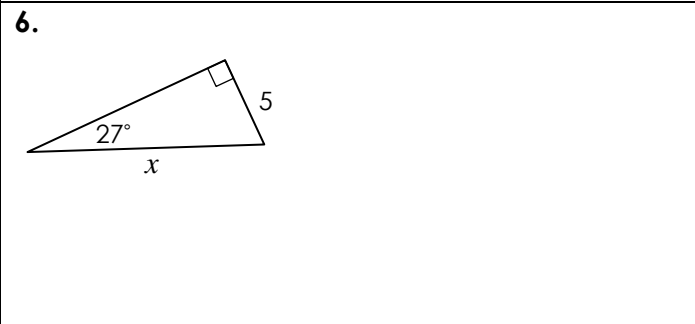
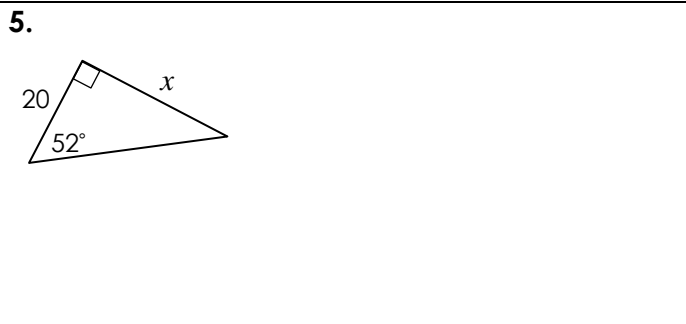
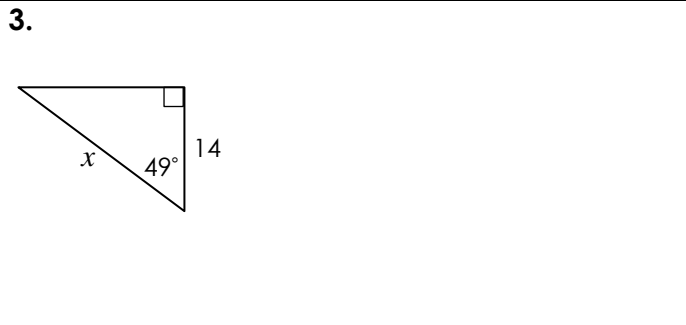


Date: _____ Per: _____

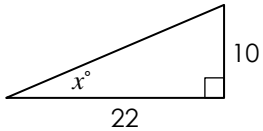
Homework 5: Trigonometry:
Finding Sides and Angles

**** This is a 2-page document! ****

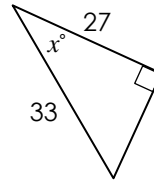
Directions: Solve for x . Round to the nearest tenth.



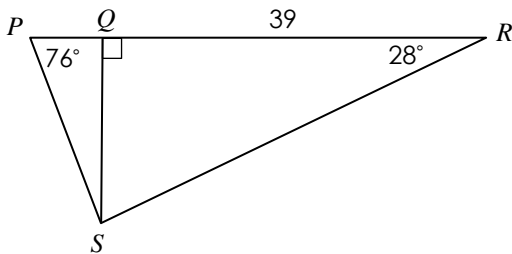
11.



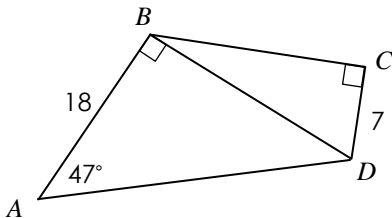
12.



13. Find PS .



14. Find $m\angle CDB$.



15. Max built a skateboarding ramp that is 16 inches high. The angle formed by the ramp and the ground is 21° . What is the length of the ramp?

16. A fireman leaned a 36-foot ladder against a building. If he placed the ladder 7 feet from the base of the building, what angle is formed between the ladder and the ground?

Name:

Date:

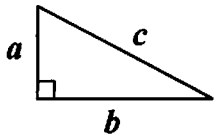
Topic:

Class:

Main Ideas/Questions

Notes/Examples

PYTHAGOREAN THEOREM



- Used to find the missing side of a right triangle.
- Sides a and b are called legs.
- Side c is called the hypotenuse.
- For any right triangle: $a^2 + b^2 = c^2$

Examples

Directions: Find the value of x. Round your answer to the nearest tenth.

1.

$$8^2 + 13^2 = x^2$$

$$64 + 169 = x^2$$

$$233 = x^2$$

$$x = 15.3 \quad (\sqrt{233})$$

2.

$$22^2 + 27^2 = x^2$$

$$484 + 729 = x^2$$

$$1213 = x^2$$

$$x = 34.8 \quad (\sqrt{1213})$$

3.

$$7^2 + x^2 = 9^2$$

$$49 + x^2 = 81$$

$$x^2 = 32$$

$$x = 5.7 \quad (4\sqrt{2})$$

4.

$$19.1^2 + x^2 = 30.5^2$$

$$364.81 + x^2 = 930.25$$

$$x^2 = 565.44$$

$$x = 23.8$$

5.

$$11^2 + x^2 = 24^2$$

$$121 + x^2 = 576$$

$$x^2 = 455$$

$$x = 21.3 \quad (\sqrt{455})$$

6.

$$x^2 + 13^2 = 16^2$$

$$x^2 + 169 = 256$$

$$x^2 = 87$$

$$x = 9.3 \quad (\sqrt{87})$$

7.

$$12^2 + a^2 = 14^2$$

$$144 + a^2 = 196$$

$$a^2 = 52$$

$$a = 7.2$$

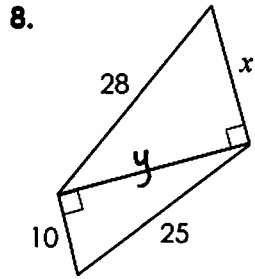
$$12^2 + b^2 = 29^2$$

$$144 + b^2 = 841$$

$$b^2 = 697$$

$$b = 26.4$$

$$x = 7.2 + 26.4 = 33.6$$



$$10^2 + y^2 = 25^2$$

$$100 + y^2 = 625$$

$$y^2 = 525$$

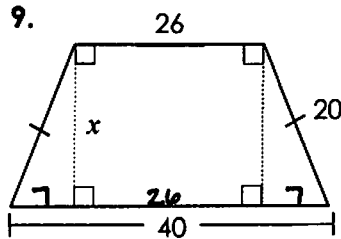
$$y = 22.9$$

$$x^2 + 22.9^2 = 25^2$$

$$x^2 + 524.41 = 625$$

$$x^2 = 100.59$$

$$x = 10.0$$



$$7^2 + x^2 = 20^2$$

$$49 + x^2 = 400$$

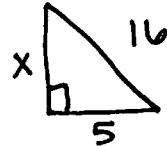
$$x^2 = 351$$

$$x = 18.7 \quad (3\sqrt{39})$$

APPLICATIONS

Directions: Draw a picture, then solve for the missing side.

10. A roofer leaned a 16-foot ladder against a house. If the base of the ladder is 5 feet from the house, how high up the house does the ladder reach?



$$5^2 + x^2 = 16^2$$

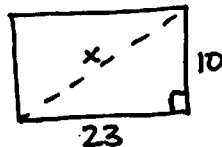
$$25 + x^2 = 256$$

$$x^2 = 231$$

$$x = 15.2$$

$$15.2 \text{ ft}$$

11. Kurt is building a rectangular deck. If the dimensions of the deck are 10 feet by 23 feet, what is the length of the diagonal of the deck?



$$10^2 + 23^2 = x^2$$

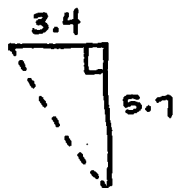
$$100 + 529 = x^2$$

$$629 = x^2$$

$$x = 25.1$$

$$25.1 \text{ ft}$$

12. Ashley jogged 3.4 miles east, then 5.7 miles south. How far is Ashley from her starting point?



$$3.4^2 + 5.7^2 = x^2$$

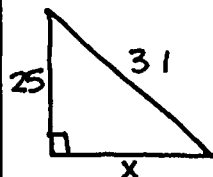
$$11.56 + 32.49 = x^2$$

$$44.05 = x^2$$

$$x = 6.6$$

$$6.6 \text{ mi}$$

13. A 31-foot support wire is attached from the top of a 25 foot telephone pole to a point on the ground. How far from the base of the pole does the wire meet the ground?



$$25^2 + x^2 = 31^2$$

$$625 + x^2 = 961$$

$$x^2 = 336$$

$$x = 18.3$$

$$18.3 \text{ ft}$$

Name: _____

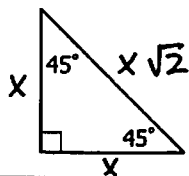
Date: _____

Topic: _____

Class: _____

Main Ideas/Questions **Notes/Examples**

45°-45°-45°
Special Right Triangle



- Leg = x
- Hypotenuse = $x\sqrt{2}$

Note: The legs of a 45°-45°-90° triangle are always congruent.

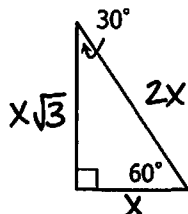
Directions: Find the value of each variable.

1. $x = \underline{8}$
 $y = \underline{8\sqrt{2}}$

2. $x = \underline{25\sqrt{2}}$
 $y = \underline{25}$

3. $\frac{19}{\sqrt{2}} = \frac{19\sqrt{2}}{2}$
 $x = \underline{\frac{19\sqrt{2}}{2}}$
 $y = \underline{\frac{19\sqrt{2}}{2}}$

30°-60°-90°
Special Right Triangle



- Shorter Leg = x
- Longer Leg = $x\sqrt{3}$
- Hypotenuse = 2x

Note: The shorter leg is always opposite the 30° angle and the longer leg is always opposite the 60° angle.

Directions: Find the value of each variable.

4. $x = \underline{5\sqrt{3}}$
 $y = \underline{10}$

5. $x = \underline{28}$
 $y = \underline{14\sqrt{3}}$

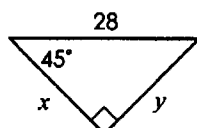
6. $x = \underline{16}$
 $y = \underline{16\sqrt{3}}$

7. $x = \underline{23\sqrt{3}}$
 $y = \underline{23}$

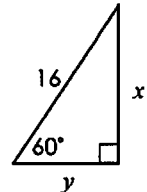
8. $\frac{20}{\sqrt{3}} = \frac{20\sqrt{3}}{3}$
 $x = \underline{\frac{40\sqrt{3}}{3}}$
 $y = \underline{\frac{20\sqrt{3}}{3}}$

9. $x = \underline{9}$
 $y = \underline{18}$

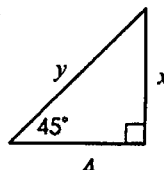
MIXED PRACTICE! Find the value of each variable.

10.  $\frac{28}{\sqrt{2}} = \frac{28\sqrt{2}}{2}$

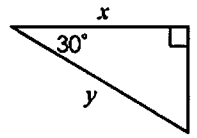
$x = \frac{14\sqrt{2}}{14\sqrt{2}}$
 $y = \frac{14\sqrt{2}}{14\sqrt{2}}$

11. 

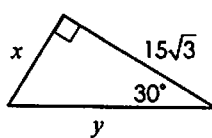
$x = \frac{8\sqrt{3}}{8}$
 $y = \frac{8}{8}$

12. 

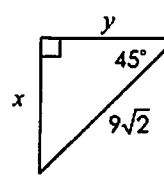
$x = \frac{4}{4\sqrt{2}}$
 $y = \frac{4\sqrt{2}}{4\sqrt{2}}$

13. 

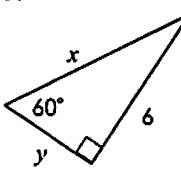
$x = \frac{11\sqrt{3}}{22}$
 $y = \frac{22}{22}$

14. 

$x = \frac{15}{30}$
 $y = \frac{30}{30}$

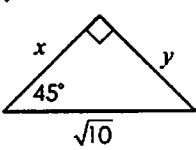
15. 

$x = \frac{9}{9}$
 $y = \frac{9}{9}$

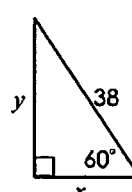
16. 

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

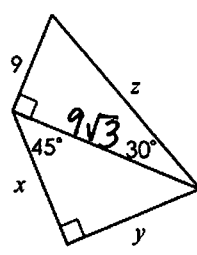
$x = \frac{4\sqrt{3}}{4\sqrt{3}}$
 $y = \frac{2\sqrt{3}}{2\sqrt{3}}$

17. 

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

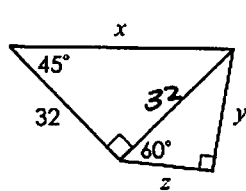
18. 

$x = \frac{19}{19\sqrt{3}}$
 $y = \frac{19\sqrt{3}}{19\sqrt{3}}$

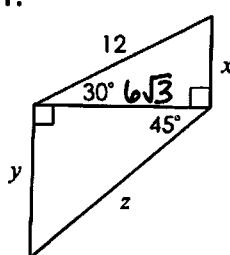
19. 

$\frac{9\sqrt{3}}{\sqrt{2}} = \frac{9\sqrt{6}}{2}$

$x = \frac{9\sqrt{6}}{2}$
 $y = \frac{9\sqrt{6}}{2}$
 $z = 18$

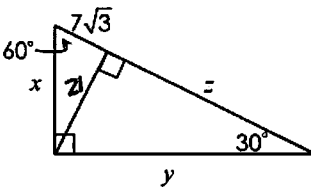
20. 

$x = \frac{32\sqrt{2}}{32\sqrt{2}}$
 $y = \frac{16\sqrt{3}}{16\sqrt{3}}$
 $z = 16$

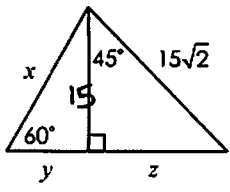
21. 

$x = \frac{6}{6}$
 $y = \frac{6\sqrt{3}}{6\sqrt{3}}$
 $z = \frac{6\sqrt{6}}{6\sqrt{6}}$

22. $7\sqrt{3} \cdot \sqrt{3} = 7\sqrt{9} = 21$

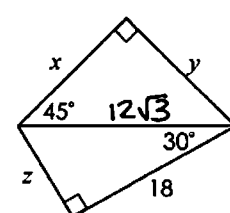


$x = \frac{14\sqrt{3}}{14\sqrt{3}}$
 $y = \frac{42}{42}$
 $z = \frac{21\sqrt{3}}{21\sqrt{3}}$

23. 

$\frac{15}{\sqrt{3}} = \frac{15\sqrt{3}}{3}$

$x = \frac{10\sqrt{3}}{10\sqrt{3}}$
 $y = \frac{5\sqrt{3}}{5\sqrt{3}}$
 $z = 15$

24. 

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

$x = \frac{6\sqrt{6}}{6\sqrt{6}}$
 $y = \frac{6\sqrt{6}}{6\sqrt{6}}$
 $z = \frac{6\sqrt{3}}{6\sqrt{3}}$

Name: _____

Unit 7: Right Triangles & Trigonometry

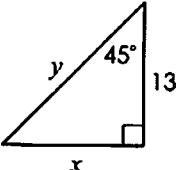
Date: _____ Per: _____

Homework 2: Special Right Triangles

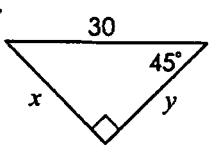


** This is a 2-page document! **

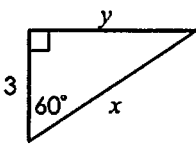
Directions: Find the value of each variable.

1. 

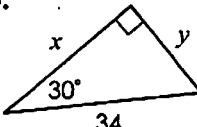
$x = \underline{13}$
 $y = \underline{13\sqrt{2}}$

2. 

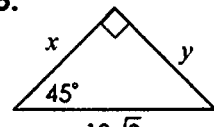
$\frac{30}{\sqrt{2}} = \frac{30\sqrt{2}}{2}$ $x = \underline{15\sqrt{2}}$
 $y = \underline{15\sqrt{2}}$

3. 

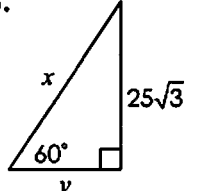
$x = \underline{6}$
 $y = \underline{3\sqrt{3}}$

4. 

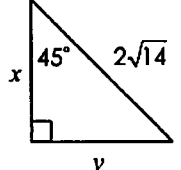
$x = \underline{17\sqrt{3}}$
 $y = \underline{17}$

5. 

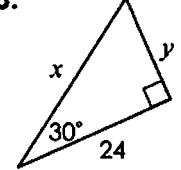
$x = \underline{10}$
 $y = \underline{10}$

6. 

$x = \underline{50}$
 $y = \underline{25}$

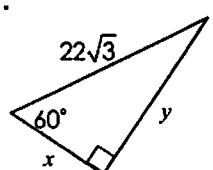
7. 

$x = \underline{2\sqrt{7}}$
 $y = \underline{2\sqrt{7}}$

8. 

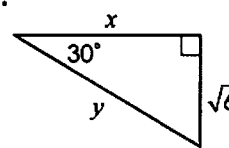
$\frac{24}{\sqrt{3}} = \frac{24\sqrt{3}}{3}$

$x = \underline{16\sqrt{3}}$
 $y = \underline{8\sqrt{3}}$

9. 

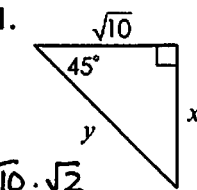
$11\sqrt{3} \cdot \sqrt{3} = 11\sqrt{9} = 33$

$x = \underline{11\sqrt{3}}$
 $y = \underline{33}$

10. 

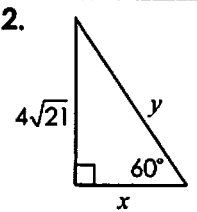
$\sqrt{6} \cdot \sqrt{3} = \sqrt{18}$

$x = \underline{3\sqrt{2}}$
 $y = \underline{2\sqrt{6}}$

11. 

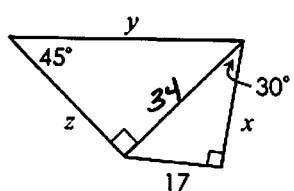
$\sqrt{10} \cdot \sqrt{2} = \sqrt{20}$

$x = \underline{\sqrt{10}}$
 $y = \underline{2\sqrt{5}}$

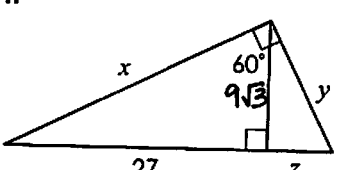
12. 

$\frac{4\sqrt{21}}{\sqrt{3}} = 4\sqrt{7}$

$x = \underline{4\sqrt{7}}$
 $y = \underline{8\sqrt{7}}$

13. 

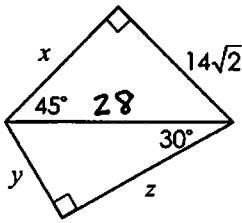
$x = \underline{17\sqrt{3}}$
 $y = \underline{34\sqrt{2}}$
 $z = \underline{34}$

14. 

$\frac{27}{\sqrt{3}} = \frac{27\sqrt{3}}{3}$

$x = \underline{18\sqrt{3}}$
 $y = \underline{18}$
 $z = \underline{9}$

15.

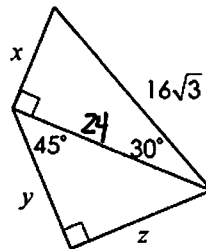


$$x = \frac{14\sqrt{2}}{2}$$

$$y = \frac{14}{2}$$

$$z = \frac{14\sqrt{3}}{2}$$

16.



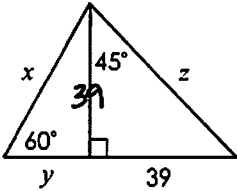
$$\frac{24}{\sqrt{2}} = \frac{24\sqrt{2}}{2}$$

$$x = \frac{8\sqrt{3}}{2}$$

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

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

17.



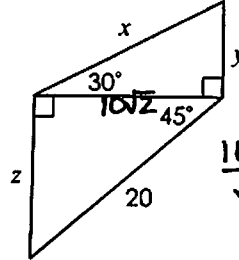
$$\frac{39}{\sqrt{3}} = \frac{39\sqrt{3}}{3}$$

$$x = \frac{26\sqrt{3}}{3}$$

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

$$z = \frac{39\sqrt{2}}{3}$$

18.



$$\frac{20}{\sqrt{2}} = \frac{20\sqrt{2}}{2}$$

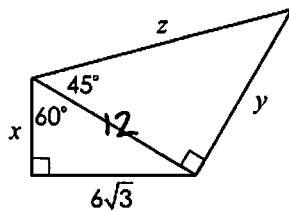
$$\frac{10\sqrt{2}}{\sqrt{3}} = \frac{10\sqrt{6}}{3}$$

$$x = \frac{20\sqrt{6}}{3}$$

$$y = \frac{10\sqrt{6}}{3}$$

$$z = \frac{10\sqrt{2}}{3}$$

19.

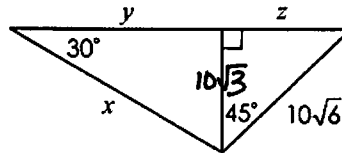


$$x = \frac{6}{2}$$

$$y = \frac{12}{2}$$

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

20.

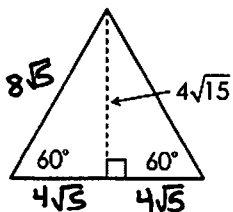


$$x = \frac{20\sqrt{3}}{2}$$

$$y = \frac{30}{2}$$

$$z = \frac{10\sqrt{3}}{2}$$

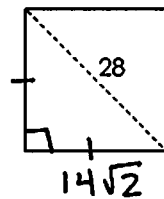
21. Find the perimeter of the triangle:



$$\frac{4\sqrt{15}}{\sqrt{3}} = 4\sqrt{5}$$

$$P = \boxed{24\sqrt{3}}$$

22. Find the perimeter of the square:



$$\frac{28}{\sqrt{2}} = \frac{28\sqrt{2}}{2} = 14\sqrt{2}$$

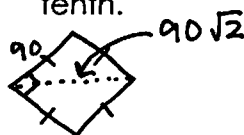
$$P = \boxed{56\sqrt{2}}$$

23. Steel loading ramps are used to load a lawn mower onto a truckbed 37.5 inches above ground. If the ramps make a 30° angle with the ground, find the length of the ramps in feet.



$$\boxed{6.25 \text{ ft}}$$

24. The infield of a baseball field is a square with sides measuring 90 feet. A ball is thrown from third to first base is caught in 1.2 seconds. Find the speed of the ball in feet per second. Round to the nearest tenth.



$$\frac{90\sqrt{2} \text{ ft}}{1.2 \text{ sec}} = \boxed{106.1 \text{ ft/sec}}$$

Name:

Date:

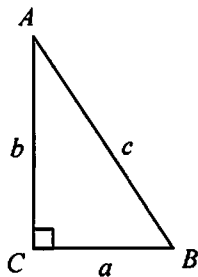
Topic:

Class:

Main Ideas/Questions	Notes/Examples
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What is TRIGONOMETRY?	The study of triangle measurement.
-----------------------	------------------------------------

TRIGONOMETRIC RATIOS	Each acute angle of a right triangle has the following trigonometric ratios:		
	SINE	The ratio of the leg opposite the angle to the hypotenuse .	<ul style="list-style-type: none"> $\sin A = \frac{a}{c}$ $\sin B = \frac{b}{c}$
	COSINE	The ratio of the leg adjacent to the angle to the hypotenuse .	<ul style="list-style-type: none"> $\cos A = \frac{b}{c}$ $\cos B = \frac{a}{c}$
	TANGENT	The ratio of the leg opposite the angle to the leg adjacent to the angle.	<ul style="list-style-type: none"> $\tan A = \frac{a}{b}$ $\tan B = \frac{b}{a}$



*** REMEMBER!! ***

SOH CAH TOA

$\sin = \frac{\text{opp}}{\text{hyp}}$

$\cos = \frac{\text{adj}}{\text{hyp}}$

$\tan = \frac{\text{opp}}{\text{adj}}$

EXAMPLES	Directions: Give each trigonometric ratio as a fraction in simplest form.		
	1.		<ul style="list-style-type: none"> $\sin A = \frac{5}{13}$ $\cos A = \frac{12}{13}$ $\tan A = \frac{5}{12}$ $\sin C = \frac{12}{13}$ $\cos C = \frac{5}{13}$ $\tan C = \frac{12}{5}$
	2.		<ul style="list-style-type: none"> $\sin W = \frac{12}{15} = \frac{4}{5}$ $\cos W = \frac{9}{15} = \frac{3}{5}$ $\tan W = \frac{12}{9} = \frac{4}{3}$ $\sin X = \frac{9}{15} = \frac{3}{5}$ $\cos X = \frac{12}{15} = \frac{4}{5}$ $\tan X = \frac{9}{12} = \frac{3}{4}$
	3.		<ul style="list-style-type: none"> $\sin L = \frac{30}{34} = \frac{15}{17}$ $\cos L = \frac{16}{34} = \frac{8}{17}$ $\tan L = \frac{30}{16} = \frac{15}{8}$ $\sin M = \frac{16}{34} = \frac{8}{17}$ $\cos M = \frac{30}{34} = \frac{15}{17}$ $\tan M = \frac{16}{30} = \frac{8}{15}$

$$9^2 + 12^2 = c^2$$

$$225 = c^2$$

$$15 = c$$

$$16^2 + b^2 = 34^2$$

$$b^2 = 900$$

$$b = 30$$

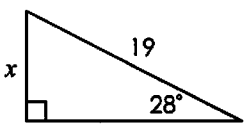
FINDING SIDE LENGTHS

using Trig

Note: Make sure
your calculator is in
degree mode!

Directions: Solve for x. Round to the nearest tenth.

4.

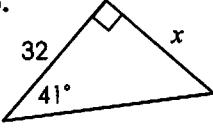


$$\sin 28 = \frac{x}{19}$$

$$x = 19 \cdot \sin 28$$

$$x = 8.9$$

5.

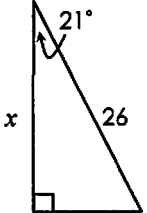


$$\tan 41 = \frac{x}{32}$$

$$32 \cdot \tan 41 = x$$

$$x = 27.8$$

6.

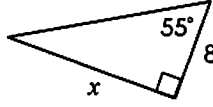


$$\cos 21 = \frac{x}{26}$$

$$x = 26 \cdot \cos 21$$

$$x = 24.3$$

7.

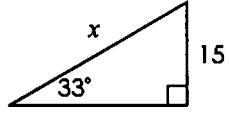


$$\tan 55 = \frac{x}{8}$$

$$x = 8 \cdot \tan 55$$

$$x = 11.4$$

8.

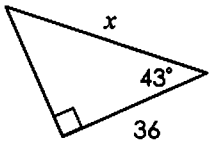


$$\sin 33 = \frac{15}{x}$$

$$\frac{x \sin 33}{\sin 33} = \frac{15}{\sin 33}$$

$$x = 27.5$$

9.

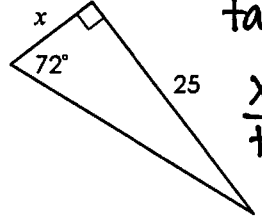


$$\cos 43 = \frac{36}{x}$$

$$\frac{x \cos 43}{\cos 43} = \frac{36}{\cos 43}$$

$$x = 49.2$$

10.

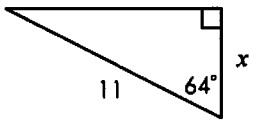


$$\tan 72 = \frac{25}{x}$$

$$\frac{x \tan 72}{\tan 72} = \frac{25}{\tan 72}$$

$$x = 8.1$$

11.

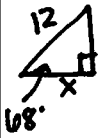


$$\cos 64 = \frac{11}{x}$$

$$x = 11 \cos 64$$

$$x = 4.8$$

12. Jake leaned a 12-foot ladder against his house. If the angle formed by the ladder and the ground is 68° , how far from the base of the house did he place the ladder?

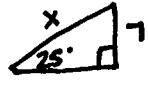


$$\cos 68 = \frac{x}{12}$$

$$12 \cos 68 = x$$

$$x = 4.5 \text{ ft}$$

13. A ramp is used to load suitcases on an airplane. If the cargo door is 7 feet from the ground and the angle formed by the end of the ramp and the ground is 25° , how long is the ramp?



$$\sin 25 = \frac{7}{x}$$

$$\frac{x \sin 25}{\sin 25} = \frac{7}{\sin 25}$$

$$x = 16.6 \text{ ft}$$

Name: _____

Unit 7: Right Triangles & Trigonometry

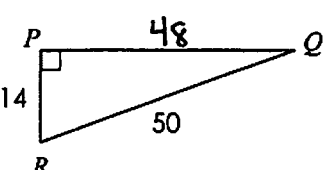
Date: _____ Per: _____

Homework 4: Trigonometric Ratios & Finding Missing Sides




** This is a 2-page document! **

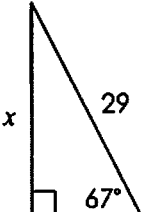
Directions: Give each trig ratio as a fraction in simplest form.

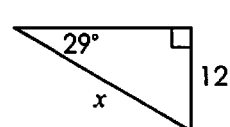
1.  $14^2 + b^2 = 50^2$
 $b^2 = 2304$
 $b = 48$

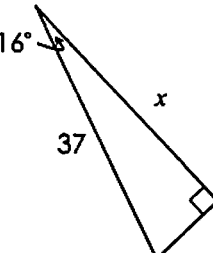
- $\sin Q = \frac{14}{50} = \frac{7}{25}$ • $\sin R = \frac{48}{50} = \frac{24}{25}$
- $\cos Q = \frac{48}{50} = \frac{24}{25}$ • $\cos R = \frac{14}{50} = \frac{7}{25}$
- $\tan Q = \frac{14}{48} = \frac{7}{24}$ • $\tan R = \frac{48}{14} = \frac{24}{7}$

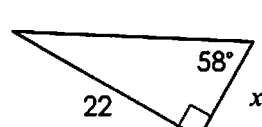
Directions: Solve for x. Round to the nearest tenth.

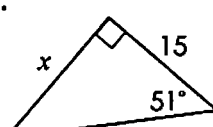
2.  $\tan 48 = \frac{x}{17}$
 $x = 17 \tan 48$
 $x = 18.9$

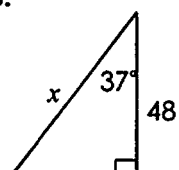
3.  $\sin 67 = \frac{x}{29}$
 $29 \sin 67 = x$
 $x = 26.7$

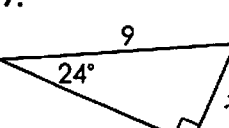
4.  $\sin 29 = \frac{12}{x}$
 $\frac{x \sin 29}{\sin 29} = \frac{12}{\sin 29}$
 $x = 24.8$

5.  $\cos 16 = \frac{x}{37}$
 $x = 37 \cos 16$
 $x = 35.6$

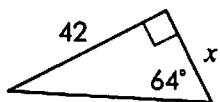
6.  $\tan 58 = \frac{22}{x}$
 $x = \frac{22}{\tan 58}$
 $x = 13.7$

7.  $\tan 51 = \frac{x}{15}$
 $15 \tan 51 = x$
 $x = 18.5$

8.  $\cos 37 = \frac{48}{x}$
 $x = \frac{48}{\cos 37}$
 $x = 60.1$

9.  $\sin 24 = \frac{x}{9}$
 $9 \sin 24 = x$
 $x = 3.7$

10.

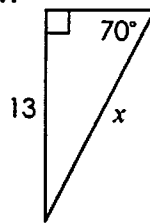


$$\tan 64 = \frac{42}{x}$$

$$x = \frac{42}{\tan 64}$$

$$x = 20.5$$

11.

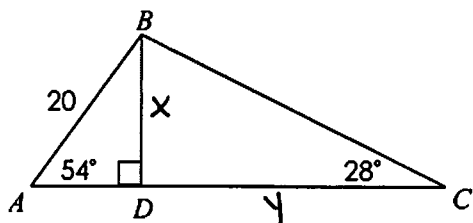


$$\sin 70 = \frac{13}{x}$$

$$x = \frac{13}{\sin 70}$$

$$x = 13.8$$

12. Find DC.



$$\sin 54 = \frac{x}{20}$$

$$x = 20 \sin 54$$

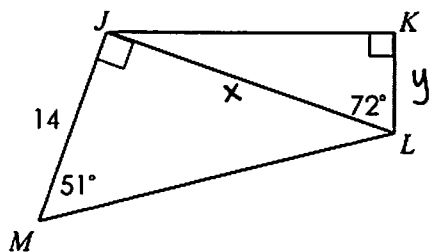
$$x = 16.2$$

$$\tan 28 = \frac{16.2}{y}$$

$$y = \frac{16.2}{\tan 28}$$

$$y = 30.5$$

13. Find KL.



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

$$14 \tan 51 = x$$

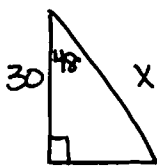
$$x = 17.3$$

$$\cos 72 = \frac{y}{17.3}$$

$$17.3 \cos 72 = y$$

$$y = 5.3$$

14. A wire is attached from the top of a 30-foot telephone pole to a stake in the ground. If the angle formed by the wire and the pole is 48° , what is the length of the wire?

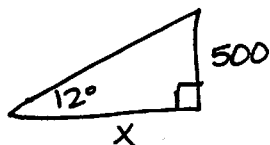


$$\cos 48 = \frac{30}{x}$$

$$x = \frac{30}{\cos 48}$$

$$x = 44.8 \text{ ft}$$

15. An airplane climbs at an angle of 12° with the ground. Find the horizontal distance it has traveled once it has reached an altitude of 500 feet.



$$\tan 12 = \frac{500}{x}$$

$$x = \frac{500}{\tan 12}$$

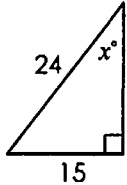
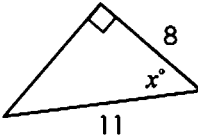
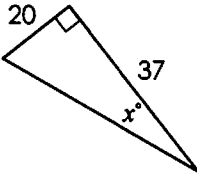
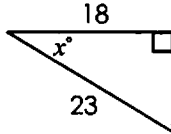
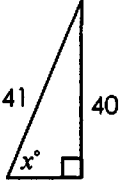

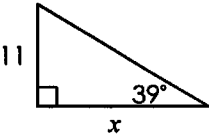
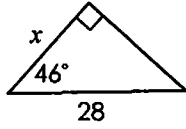
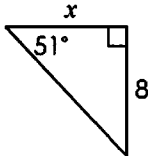
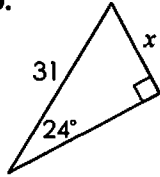
$$x = 2352.3 \text{ ft}$$

Name:

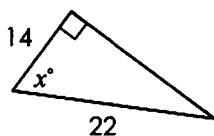
Date:

Topic:

Class:

Main Ideas/Questions	Notes/Examples	
<p>FINDING ANGLE MEASURES using Trig</p> <p>Note: Make sure your calculator is in degree mode!</p>	<p>If you know the sin, cosine, or tangent ratio of an angle, you can use the inverse of the ratio (\sin^{-1}, \cos^{-1}, \tan^{-1}) to find the measure of the angle.</p>	
	<p>Directions: Find the value of x. Round to the nearest tenth.</p>	
	<p>1.  $\sin x = \frac{15}{24}$ $x = \sin^{-1}\left(\frac{15}{24}\right)$ $x = 38.7^\circ$</p>	<p>2.  $\cos x = \frac{8}{11}$ $x = \cos^{-1}\left(\frac{8}{11}\right)$ $x = 43.3^\circ$</p>
	<p>3.  $\tan x = \frac{20}{37}$ $x = \tan^{-1}\left(\frac{20}{37}\right)$ $x = 28.4^\circ$</p>	<p>4.  $\cos x = \frac{18}{23}$ $x = \cos^{-1}\left(\frac{18}{23}\right)$ $x = 38.5^\circ$</p>
	<p>5.  $\sin x = \frac{40}{41}$ $x = \sin^{-1}\left(\frac{40}{41}\right)$ $x = 77.3^\circ$</p>	<p>6.  $\tan x = \frac{7}{5}$ $x = \tan^{-1}\left(\frac{7}{5}\right)$ $x = 54.5^\circ$</p>
	<p>REVIEW: Sides & Angles</p>	<p>Directions: Find the value of x. Round to the nearest tenth.</p>
<p>7.  $\tan 39 = \frac{11}{x}$ $x = \frac{11}{\tan 39}$ $x = 13.6$</p>		<p>8.  $\cos 46 = \frac{x}{28}$ $28 \cos 46 = x$ $x = 19.5$</p>
<p>9.  $\tan 51 = \frac{8}{x}$ $x = \frac{8}{\tan 51}$ $x = 6.5$</p>		<p>10.  $\sin 24 = \frac{x}{31}$ $31 \sin 24 = x$ $x = 12.6$</p>

11.

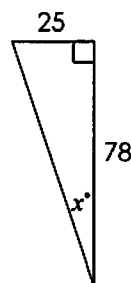


$$\cos X = \frac{14}{22}$$

$$X = \cos^{-1}\left(\frac{14}{22}\right)$$

$$X = 50.5^\circ$$

12.

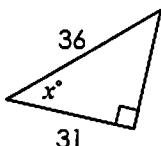


$$\tan X = \frac{25}{78}$$

$$X = \tan^{-1}\left(\frac{25}{78}\right)$$

$$X = 17.8^\circ$$

13.

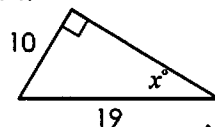


$$\cos X = \frac{31}{36}$$

$$X = \cos^{-1}\left(\frac{31}{36}\right)$$

$$X = 30.6^\circ$$

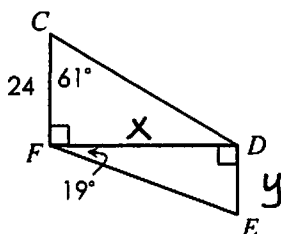
14.



$$\sin X = \frac{10}{19}$$

$$X = \sin^{-1}\left(\frac{10}{19}\right)$$

$$X = 31.8^\circ$$

15. Find DE .

$$\tan 61 = \frac{x}{24}$$

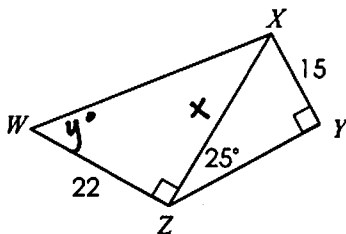
$$x = 24 \tan 61$$

$$x = 43.3$$

$$\tan 19 = \frac{y}{43.3}$$

$$y = 43.3 \tan 19$$

$$y = 14.9$$

16. Find $m\angle W$.

$$\sin 25 = \frac{15}{x}$$

$$x = \frac{15}{\sin 25}$$

$$x = 35.5$$

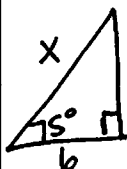
$$\tan y = \frac{35.5}{22}$$

$$y = \tan^{-1}\left(\frac{35.5}{22}\right)$$

$$y = 58.2^\circ$$

APPLICATIONS

17. A ladder leaning against a wall makes an angle of 75° with the ground. If the foot of the ladder is 6 feet from the base of the wall, what is the length of the ladder?

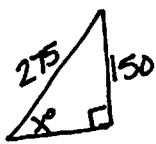


$$\cos 75 = \frac{6}{x}$$

$$x = \frac{6}{\cos 75}$$

$$x = 23.2 \text{ ft}$$

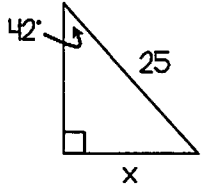
18. Jaden is flying a kite and lets off 275 feet of string. If the kite is 150 feet above ground and assuming the string is straight, what angle does the string make with the ground?



$$\sin X = \frac{150}{275}$$

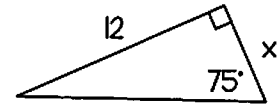
$$X = \sin^{-1}\left(\frac{150}{275}\right)$$

$$X = 33.1^\circ$$

EXAMPLE 1

$$\sin 42 = \frac{x}{25}$$

$$x = 16.7$$

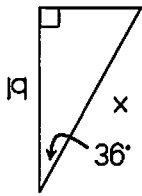
EXAMPLE 2

$$\tan 75 = \frac{12}{x}$$

$$x = \frac{12}{\tan 75}$$

$$x = 3.2$$

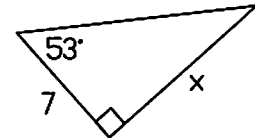
Finding missing
SIDES with
TRIGONOMETRY



$$\cos 36 = \frac{19}{x}$$

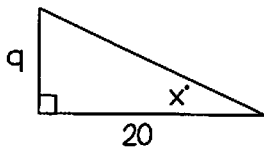
$$x = \frac{19}{\cos 36}$$

$$x = 23.5$$



$$\tan 53 = \frac{x}{7}$$

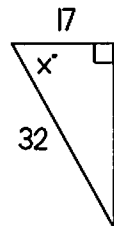
$$x = 9.3$$

EXAMPLE 3

$$\tan x = \frac{9}{20}$$

$$x = \tan^{-1}\left(\frac{9}{20}\right)$$

$$x = 24.2^\circ$$

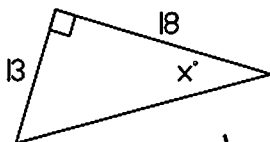
EXAMPLE 2

$$\cos x = \frac{17}{32}$$

$$x = \cos^{-1}\left(\frac{17}{32}\right)$$

$$x = 57.9^\circ$$

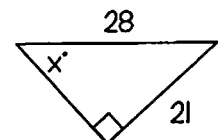
Finding missing
ANGLES with
TRIGONOMETRY



$$\tan x = \frac{13}{18}$$

$$x = \tan^{-1}\left(\frac{13}{18}\right)$$

$$x = 35.8^\circ$$



$$\sin x = \frac{21}{28}$$

$$x = \sin^{-1}\left(\frac{21}{28}\right)$$

$$x = 48.6^\circ$$

EXAMPLE 3**EXAMPLE 4**

Name: _____

Unit 7: Right Triangles & Trigonometry

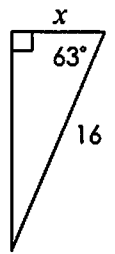
Date: _____ Per: _____

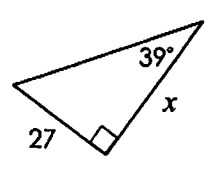
Homework 5: Trigonometry:
Finding Sides and Angles

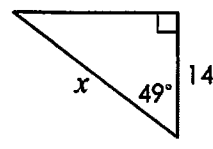


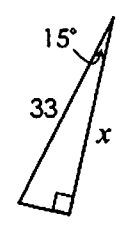
**** This is a 2-page document! ****

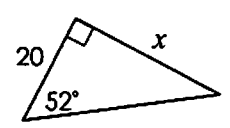
Directions: Solve for x . Round to the nearest tenth.

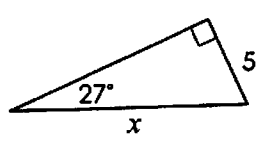
1.  $\cos 63 = \frac{x}{16}$
 $x = 7.3$

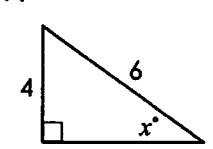
2.  $\tan 39 = \frac{27}{x}$
 $x = 33.3$

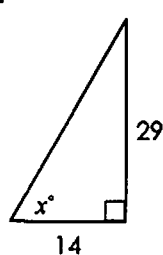
3.  $\cos 49 = \frac{14}{x}$
 $x = 21.3$

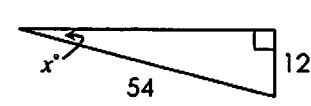
4.  $\cos 15 = \frac{x}{33}$
 $x = 31.9$

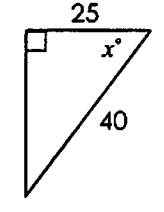
5.  $\tan 52 = \frac{x}{20}$
 $x = 25.6$

6.  $\sin 27 = \frac{5}{x}$
 $x = 11$

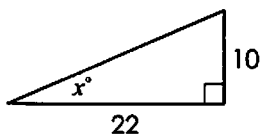
7.  $\sin x = \frac{4}{6}$
 $x = \sin^{-1}\left(\frac{4}{6}\right)$
 $x = 41.8^\circ$

8.  $\tan x = \frac{29}{14}$
 $x = \tan^{-1}\left(\frac{29}{14}\right)$
 $x = 64.2^\circ$

9.  $\sin x = \frac{12}{54}$
 $x = \sin^{-1}\left(\frac{12}{54}\right)$
 $x = 12.8^\circ$

10.  $\cos x = \frac{25}{40}$
 $x = \cos^{-1}\left(\frac{25}{40}\right)$
 $x = 51.3^\circ$

11.

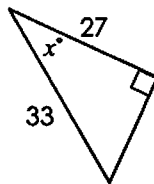


$$\tan x = \frac{10}{22}$$

$$x = \tan^{-1}\left(\frac{10}{22}\right)$$

$$x = 24.4^\circ$$

12.

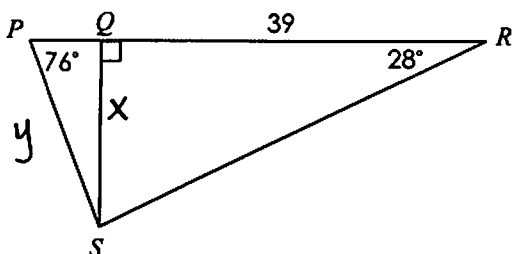


$$\cos x = \frac{27}{33}$$

$$x = \cos^{-1}\left(\frac{27}{33}\right)$$

$$x = 35.1^\circ$$

13. Find PS.



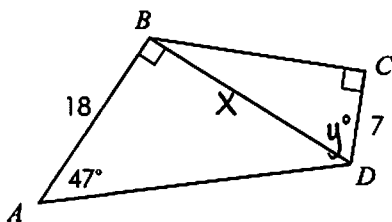
$$\tan 28 = \frac{x}{39}$$

$$x = 20.7$$

$$\sin 76 = \frac{20.7}{y}$$

$$y = \frac{20.7}{\sin 76}$$

$$y = 21.3$$

14. Find $m\angle CDB$.

$$\tan 47 = \frac{x}{18}$$

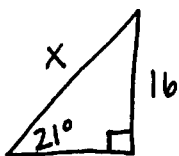
$$x = 19.3$$

$$\cos y = \frac{7}{19.3}$$

$$y = \cos^{-1}\left(\frac{7}{19.3}\right)$$

$$y = 68.7^\circ$$

15. Max built a skateboarding ramp that is 16 inches high. The angle formed by the ramp and the ground is 21° . What is the length of the ramp?

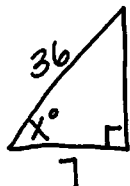


$$\sin 21 = \frac{16}{x}$$

$$x = \frac{16}{\sin 21}$$

$$x = 44.6 \text{ in}$$

16. A fireman leaned a 36-foot ladder against a building. If he placed the ladder 7 feet from the base of the building, what angle is formed between the ladder and the ground?



$$\cos x = \frac{7}{36}$$

$$x = \cos^{-1}\left(\frac{7}{36}\right)$$

$$x = 78.8^\circ$$