

Geometry

Unit 3-9



Right Triangles

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Unit 9 Lesson 1

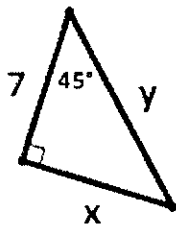
The Isosceles Right Triangle

DO NOW:

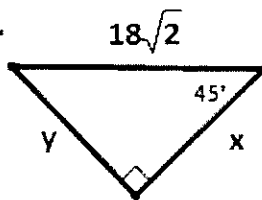
1. Draw an isosceles right triangle.
2. Indicate all angle measures.
3. Choose a number to represent the length of the legs.
4. Use the Pythagorean theorem to find the length of the hypotenuse in **SIMPLEST RADICAL FORM**.

Find the EXACT length of each side marked as x or y.

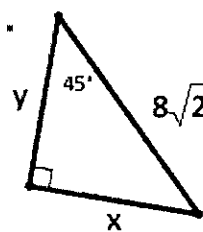
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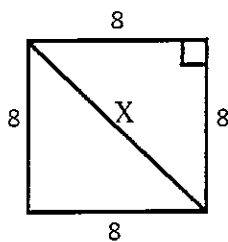
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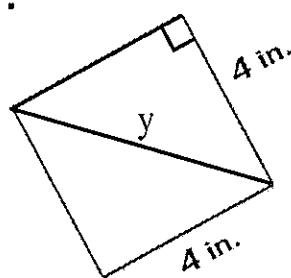
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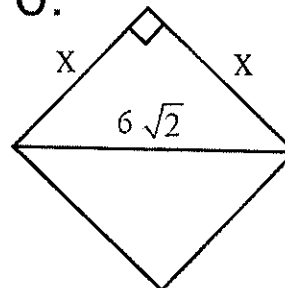
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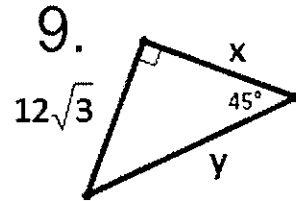
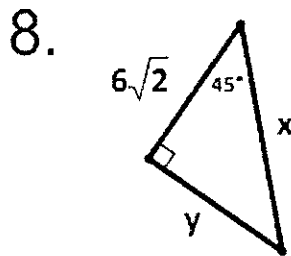
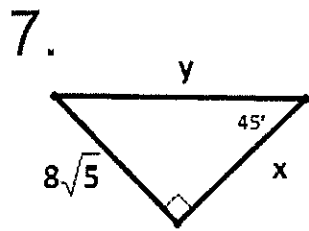
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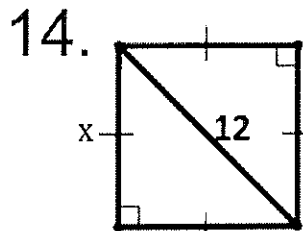
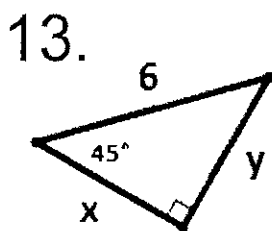
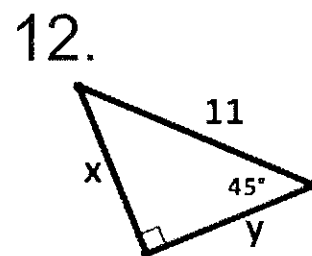
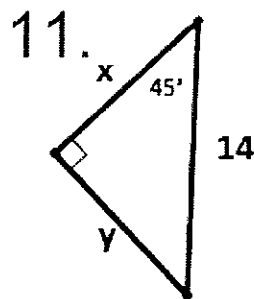
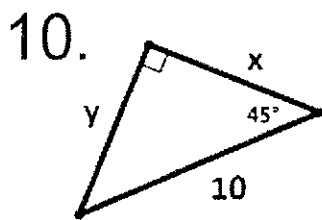
6.



Find the EXACT length of each side marked as x or y.

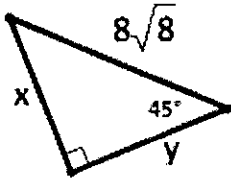


Find the EXACT length of each side marked as x or y.

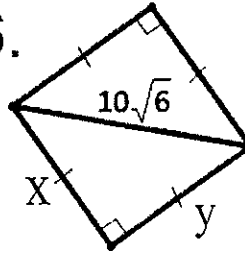


Find the EXACT length of each side marked as x or y.

15.



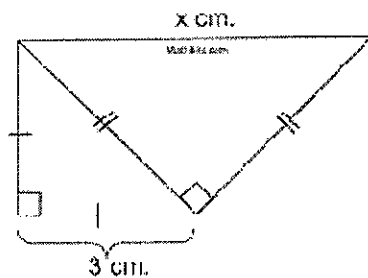
16.



17. If the diagonal of a square is 18, find the area of the square.

18.

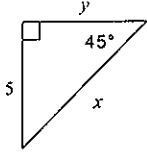
Find x.



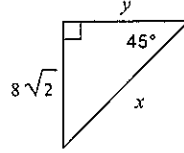
45-45-90 Practice

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

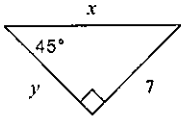
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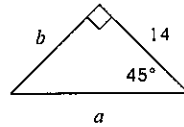
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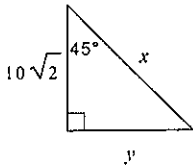
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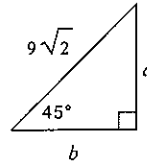
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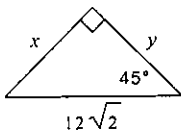
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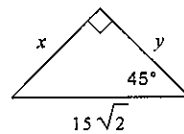
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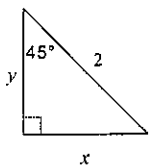
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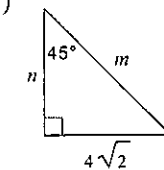
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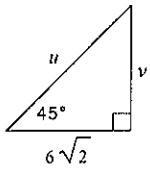
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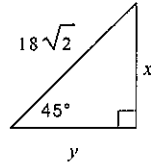
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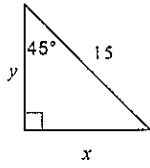
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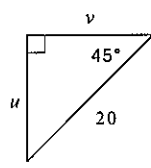
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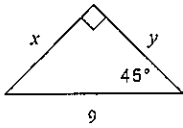
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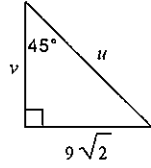
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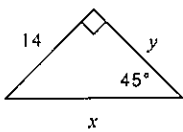
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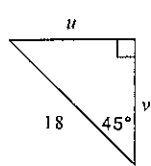
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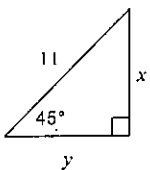
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18)



19)



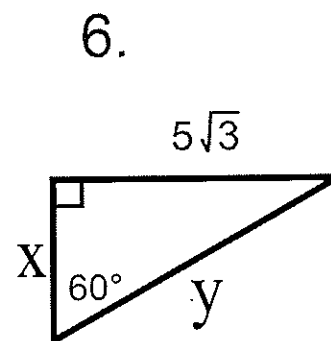
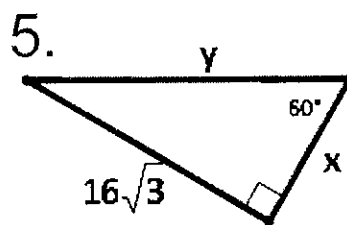
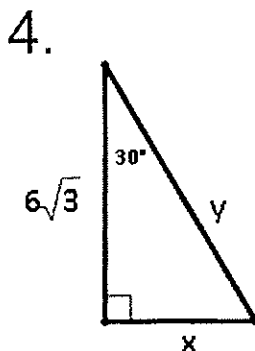
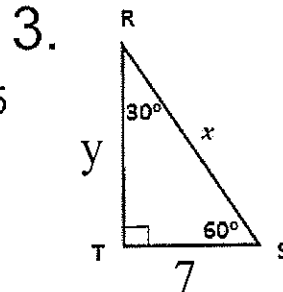
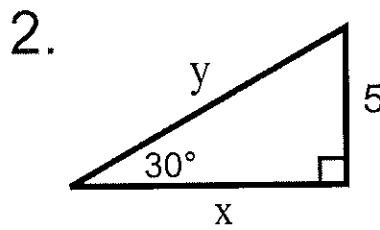
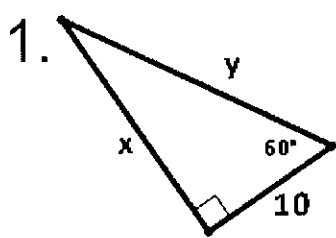
Unit 9 Lesson 2

The 30-60-90 Triangle

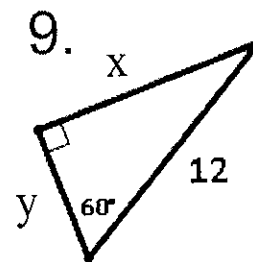
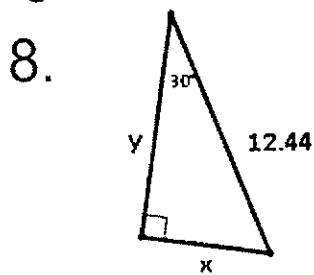
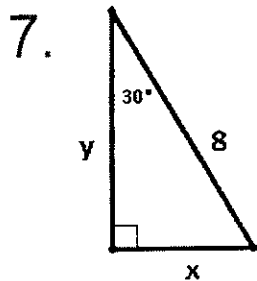
DO NOW:

1. Draw an equilateral triangle.
2. Choose an even number to represent the length of each side.
3. Draw in an altitude to the bottom side (label the right angle).
4. Determine the length of each piece of the bottom side.
5. Use the Pythagorean theorem to find the length of the altitude in SIMPLEST RADICAL FORM.

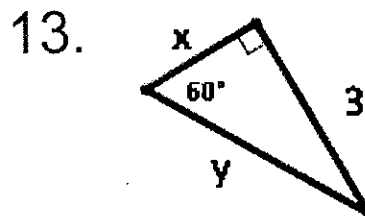
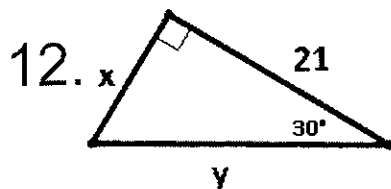
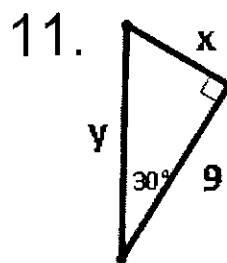
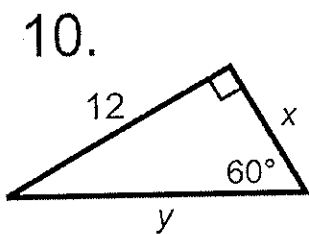
Find the EXACT length of each side marked as x or y.



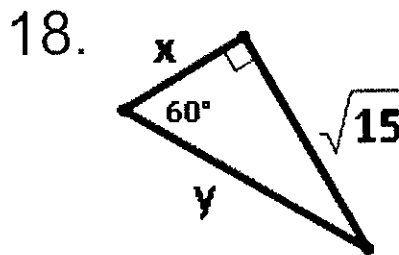
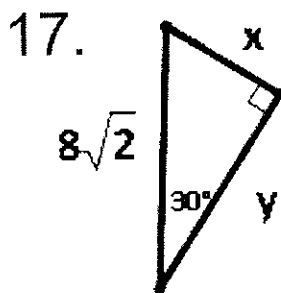
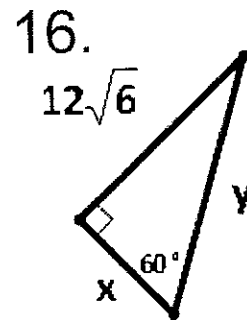
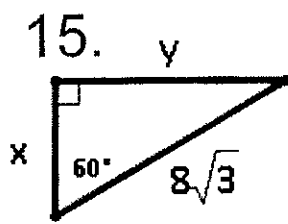
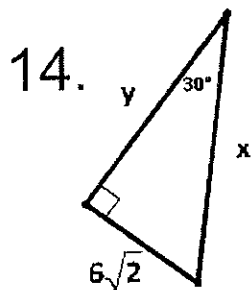
Find the EXACT length of each side marked as x or y.



Find the EXACT length of each side marked as x or y.

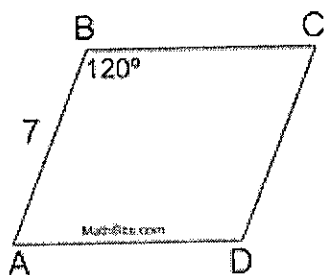


Find the EXACT length of each side marked as x or y.

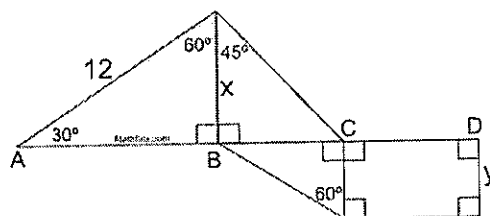


19. The altitude of an equilateral triangle is 9 inches long. Find the perimeter of the equilateral triangle.

20. Given Rhombus ABCD. Find BD.



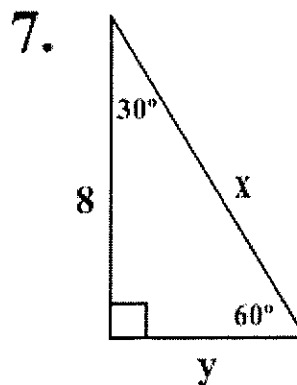
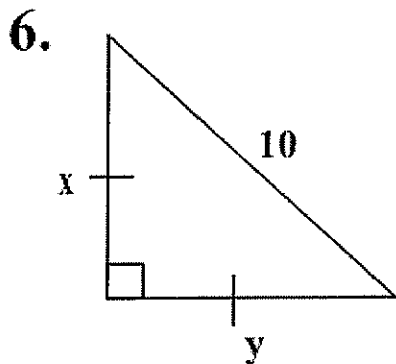
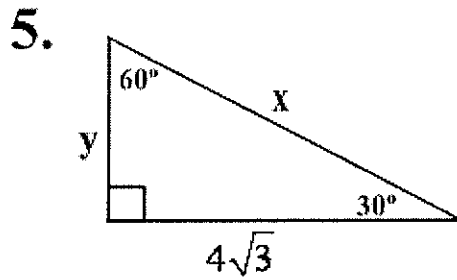
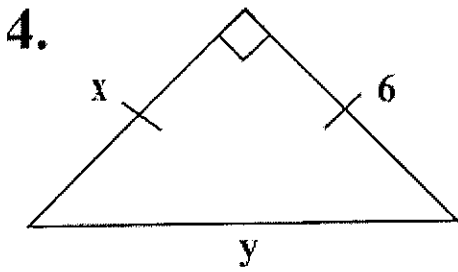
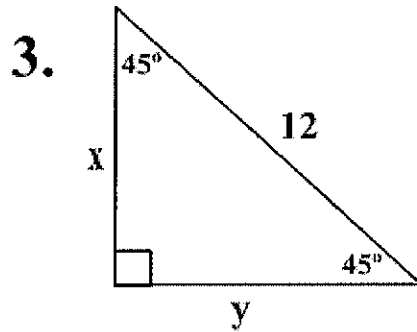
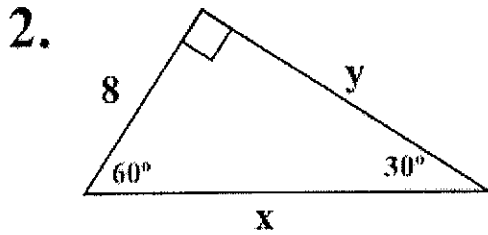
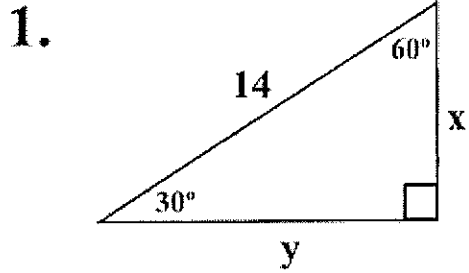
21. In the diagram below, A, B, C, D are collinear. Find x and y.





SPECIAL RIGHT TRIANGLES

Find the unknown lengths.

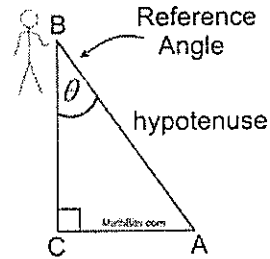
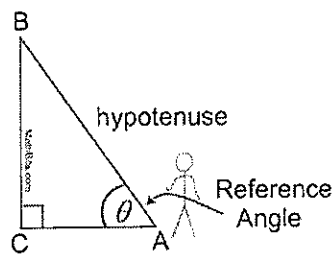


Trigonometric Table

degrees	sine	cosine	tangent	degrees	sine	cosine	tangent
1	0.0175	0.9998	0.0175	46	0.7193	0.6947	1.0355
2	0.0349	0.9994	0.0349	47	0.7314	0.6820	1.0724
3	0.0523	0.9986	0.0524	48	0.7431	0.6691	1.1106
4	0.0698	0.9976	0.0699	49	0.7547	0.6561	1.1504
5	0.0872	0.9962	0.0875	50	0.7660	0.6428	1.1918
6	0.1045	0.9945	0.1051	51	0.7771	0.6293	1.2349
7	0.1219	0.9925	0.1228	52	0.7880	0.6157	1.2799
8	0.1392	0.9903	0.1405	53	0.7986	0.6018	1.3270
9	0.1564	0.9877	0.1584	54	0.8090	0.5878	1.3764
10	0.1736	0.9848	0.1763	55	0.8192	0.5736	1.4281
11	0.1908	0.9816	0.1944	56	0.8290	0.5592	1.4826
12	0.2079	0.9781	0.2126	57	0.8387	0.5446	1.5399
13	0.2250	0.9744	0.2309	58	0.8480	0.5299	1.6003
14	0.2419	0.9703	0.2493	59	0.8572	0.5150	1.6643
15	0.2588	0.9659	0.2679	60	0.8660	0.5000	1.7321
16	0.2756	0.9613	0.2867	61	0.8746	0.4848	1.8040
17	0.2924	0.9563	0.3057	62	0.8829	0.4695	1.8807
18	0.3090	0.9511	0.3249	63	0.8910	0.4540	1.9626
19	0.3256	0.9455	0.3443	64	0.8988	0.4384	2.0503
20	0.3420	0.9397	0.3640	65	0.9063	0.4226	2.1445
21	0.3584	0.9336	0.3839	66	0.9135	0.4067	2.2460
22	0.3746	0.9272	0.4040	67	0.9205	0.3907	2.3559
23	0.3907	0.9205	0.4245	68	0.9272	0.3746	2.4751
24	0.4067	0.9135	0.4452	69	0.9336	0.3584	2.6051
25	0.4226	0.9063	0.4663	70	0.9397	0.3420	2.7475
26	0.4384	0.8988	0.4877	71	0.9455	0.3256	2.9042
27	0.4540	0.8910	0.5095	72	0.9511	0.3090	3.0777
28	0.4695	0.8829	0.5317	73	0.9563	0.2924	3.2709
29	0.4848	0.8746	0.5543	74	0.9613	0.2756	3.4874
30	0.5000	0.8660	0.5774	75	0.9659	0.2588	3.7321
31	0.5150	0.8572	0.6009	76	0.9703	0.2419	4.0108
32	0.5299	0.8480	0.6249	77	0.9744	0.2250	4.3315
33	0.5446	0.8387	0.6494	78	0.9781	0.2079	4.7046
34	0.5592	0.8290	0.6745	79	0.9816	0.1908	5.1446
35	0.5736	0.8192	0.7002	80	0.9848	0.1736	5.6713
36	0.5878	0.8090	0.7265	81	0.9877	0.1564	6.3138
37	0.6018	0.7986	0.7536	82	0.9903	0.1392	7.1154
38	0.6157	0.7880	0.7813	83	0.9925	0.1219	8.1443
39	0.6293	0.7771	0.8098	84	0.9945	0.1045	9.5144
40	0.6428	0.7660	0.8391	85	0.9962	0.0872	11.4301
41	0.6561	0.7547	0.8693	86	0.9976	0.0698	14.3007
42	0.6691	0.7431	0.9004	87	0.9986	0.0523	19.0811
43	0.6820	0.7314	0.9325	88	0.9994	0.0349	28.6363
44	0.6947	0.7193	0.9657	89	0.9998	0.0175	57.2900

Unit 9 Lesson 3

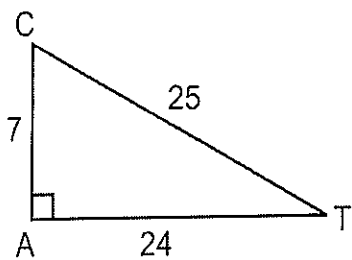
Introduction to Trigonometry and Finding Angles of a Right Triangle



Sine (sin)	Cosine (cos)	Tangent (tan)
$\sin \theta = \frac{\textit{opposite}}{\textit{hypotenuse}}$	$\cos \theta = \frac{\textit{adjacent}}{\textit{hypotenuse}}$	$\tan \theta = \frac{\textit{opposite}}{\textit{adjacent}}$

BEWARE! Trigonometric functions work ONLY in right triangles!

Example 1



$$\sin T =$$

$$\sin C =$$

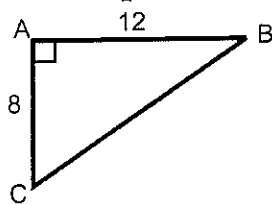
$$\cos T =$$

$$\cos C =$$

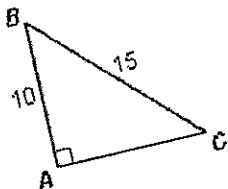
$$\tan T =$$

$$\tan C =$$

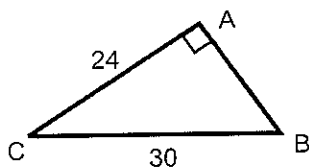
Example 2 Find the measure of $\angle C$ to nearest tenth of a degree.



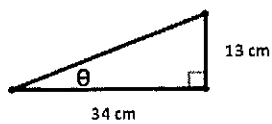
Example 3 Find the measure of $\angle C$ to nearest hundredth of a degree.



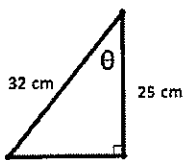
Example 4 Find the measure of $\angle C$ to nearest degree.



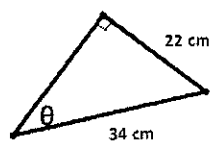
Example 5



Example 6



Example 7



Round answers to the nearest degree

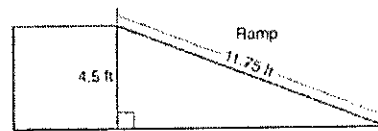
Example 8

A man who is 5 feet 9 inches tall casts a shadow of 8 feet 6 inches. Assuming that the man is standing perpendicular to the ground, what is the angle of elevation from the end of the shadow to the top of the man's head, to the *nearest tenth of a degree*?

- 1 34.1
- 2 34.5
- 3 42.6
- 4 55.9

Example 9

The diagram below shows a ramp connecting the ground to a loading platform 4.5 feet above the ground. The ramp measures 11.75 feet from the ground to the top of the loading platform.



Determine and state, to the *nearest degree*, the angle of elevation formed by the ramp and the ground.

Name _____

Using Trigonometry to Find Angle Measures

Date _____ Period _____

Find each angle measure to the nearest degree.

1) $\tan A = 2.0503$

2) $\cos Z = 0.1219$

3) $\tan Y = 0.6494$

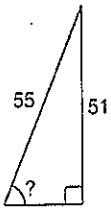
4) $\sin U = 0.8746$

5) $\cos V = 0.6820$

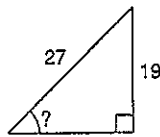
6) $\sin C = 0.2756$

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

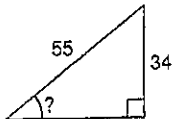
7)



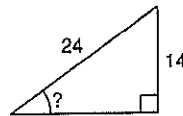
8)



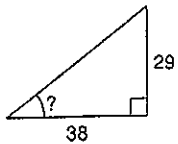
9)



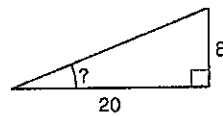
10)



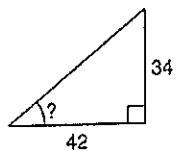
11)



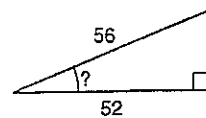
12)



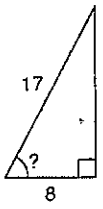
13)



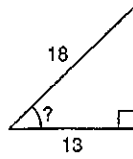
14)



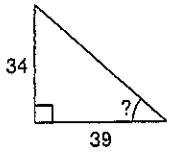
15)



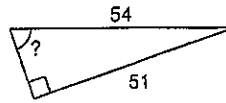
16)



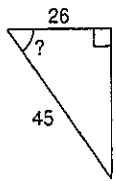
17)



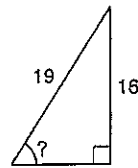
18)



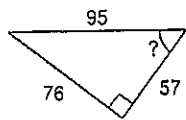
19)



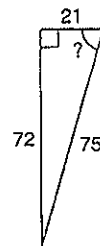
20)



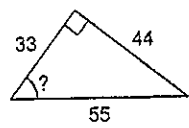
21)



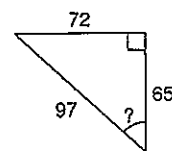
22)



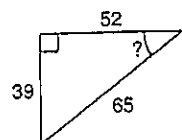
23)



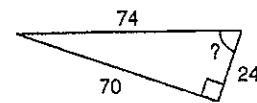
24)



25)



26)



Unit 9 Lesson 4

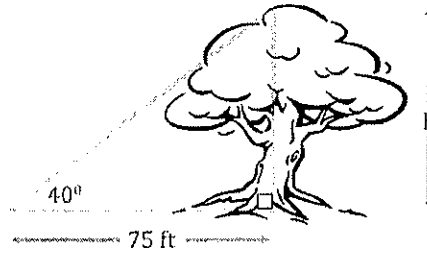
Using Trigonometry to Find Length of Sides of a Right Triangle

Steps:

1. Locate the reference angle
2. LABEL the triangle with o , h , and a .
 - o - opposite side (the side across from you)
 - h - hypotenuse (across from the right angle)
 - a - adjacent side (the leftover side)
3. Choose the ratio
4. Set up your equation
5. Cross Multiply to solve
6. Round appropriately

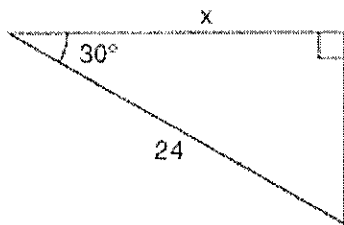
Example 1

Find the height of the tree to the nearest foot.



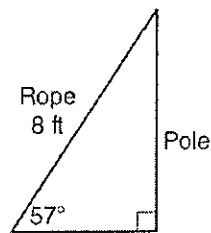
Example 2

In the right triangle shown in the diagram below, what is the value of x to the nearest whole number?



Example 3

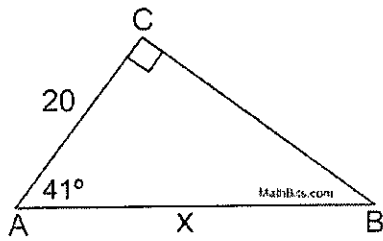
An 8-foot rope is tied from the top of a pole to a stake in the ground, as shown in the diagram below.



If the rope forms a 57° angle with the ground, what is the height of the pole, to the nearest tenth of a foot?

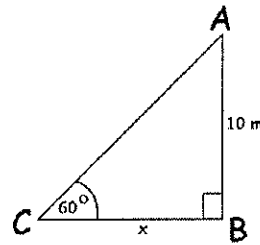
Example 4

Find x to the *nearest tenth*.

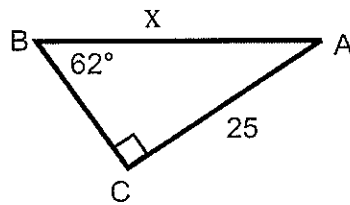


Example 5

Find x to the *nearest tenth*.

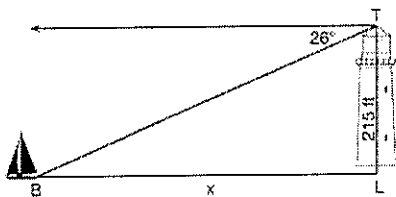


Example 6 Find x to the *nearest tenth*.



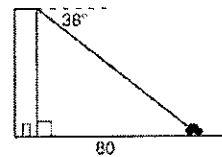
Example 7

The top of a lighthouse, T , is 215 feet above sea level, L , as shown in the diagram below. The angle of depression from the top of the lighthouse to a boat, B , at sea is 26° . Determine, to the *nearest foot*, the horizontal distance, x , from the boat to the base of the lighthouse.



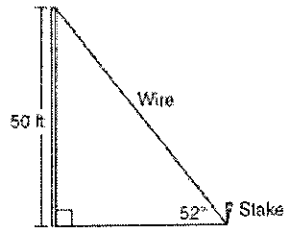
Example 8

From the top of an apartment building, the angle of depression to a car parked on the street below is 38° , as shown in the diagram below. The car is parked 80 feet from the base of the building. Find the height of the building, to the *nearest tenth of a foot*.



Example 9

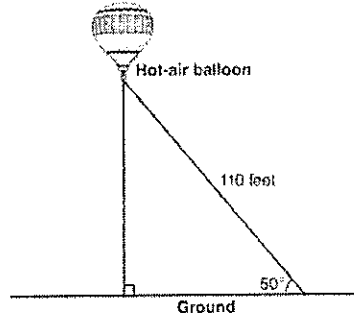
A stake is to be driven into the ground away from the base of a 50-foot pole, as shown in the diagram below. A wire from the stake on the ground to the top of the pole is to be installed at an angle of elevation of 52° .



How far away from the base of the pole should the stake be driven in, to the *nearest foot*? What will be the length of the wire from the stake to the top of the pole, to the *nearest foot*?

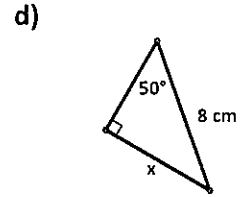
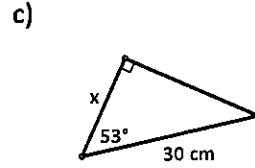
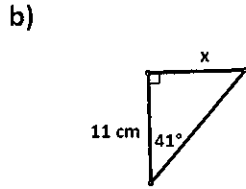
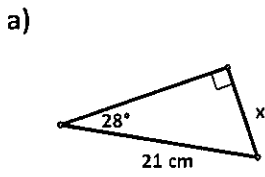
Example 10

A hot-air balloon is tied to the ground with two taut (straight) ropes, as shown in the diagram below. One rope is directly under the balloon and makes a right angle with the ground. The other rope forms an angle of 50° with the ground.



Determine the height, to the *nearest foot*, of the balloon directly above the ground. Determine the distance, to the *nearest foot*, on the ground between the two ropes.

1. Solve for the side x. (Round all final answers to nearest hundredth)



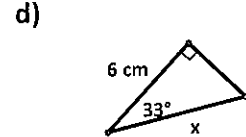
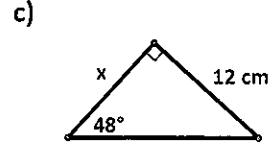
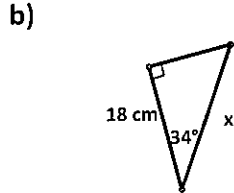
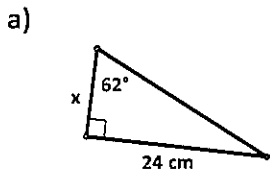
$x \approx$ _____

$x \approx$ _____

$x \approx$ _____

$x \approx$ _____

2. Solve for the side x. (Round all final answers to nearest tenth)



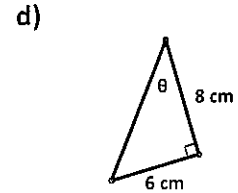
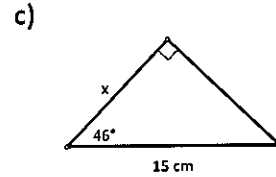
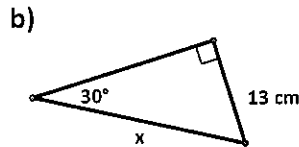
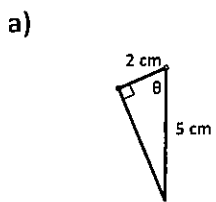
$x =$ _____

$x =$ _____

$x =$ _____

$x =$ _____

3. Solve for the missing information. (Round all final answers to nearest integer)



$\theta =$ _____

$x \approx$ _____

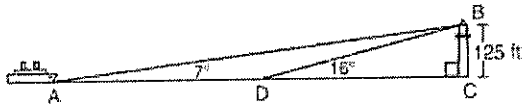
$x \approx$ _____

$\theta =$ _____

Unit 9 Lesson 5 Double Right Triangles

Example 1

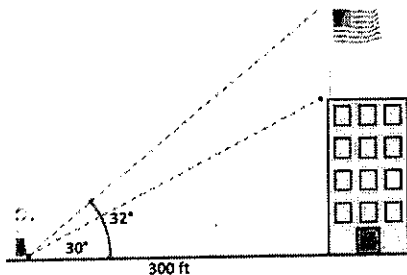
As shown in the diagram below, a ship is heading directly toward a lighthouse whose beacon is 125 feet above sea level. At the first sighting, point A , the angle of elevation from the ship to the light was 7° . A short time later, at point D , the angle of elevation was 16° .



To the *nearest foot*, determine and state how far the ship traveled from point A to point D .

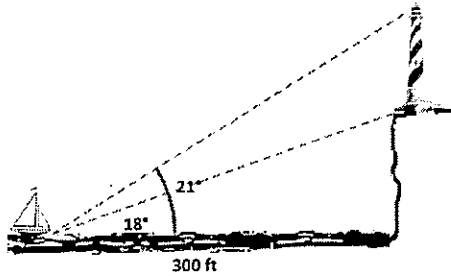
Example 2

A flagpole is at the top of a building 300 feet from the base of the building, the angle of elevation of the top of the pole is 32° and the angle of elevation of the bottom of the pole is 30° . Determine the length of the flagpole (to the nearest foot).



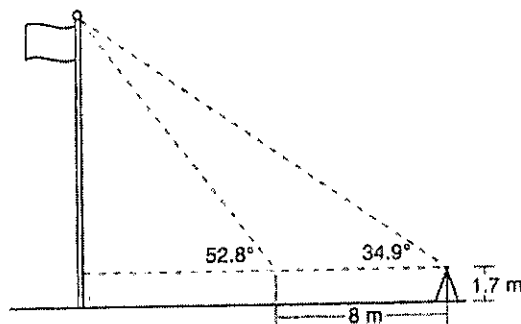
Example 3

In a boat 300 feet from the base of the cliff, Jack sees the base of the lighthouse at 18° and the top of the lighthouse at 21° . How tall is the lighthouse (to the nearest foot)?



Example 4

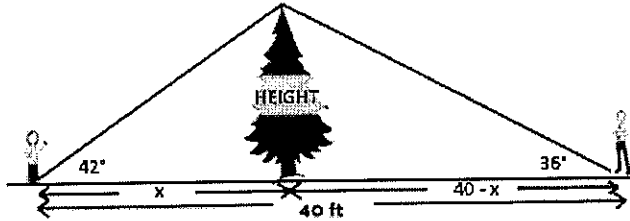
Cathy wants to determine the height of the flagpole shown in the diagram below. She uses a survey instrument to measure the angle of elevation to the top of the flagpole, and determines it to be 34.9° . She walks 8 meters closer and determines the new measure of the angle of elevation to be 52.8° . At each measurement, the survey instrument is 1.7 meters above the ground.



Determine and state, to the nearest tenth of a meter, the height of the flagpole.

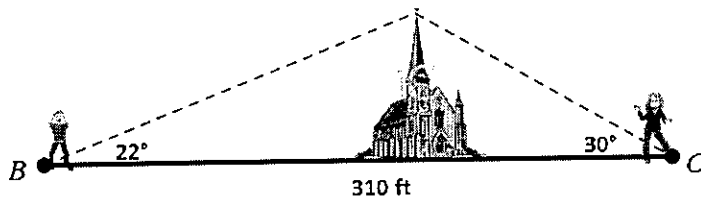
Example 5

Sally and Jonathan are on either side of the tree and 40 feet apart. Sally sees the top of the tree at 42° and Jonathan sees the top of the tree at 36° . How high is the tree (to the nearest foot)?



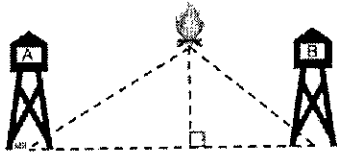
Example 6

On a sightseeing trip to Paris, Betty spots the spire of a cathedral at 22° and Cathy spots the same spire at 30° . If the two girls are 310 feet apart, determine the height of the spire (to the nearest foot).



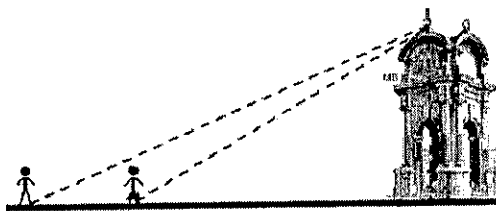
Example 7

Two fire towers are 40 kilometers apart. Tower B is due east of tower A. A fire is spotted from both towers. From tower A the fire is $E 21^\circ N$ and from tower B the fire is $W 38^\circ N$. Find the distance of the fire from the line connecting the towers, to the nearest kilometer.



Example 8

From his location, Rick sees the angle of elevation of the top of a monument to be 15° . Kate sees the angle of elevation of the top to be 20° . If Rick and Kate are 100 feet apart, how tall is the monument, to the nearest foot.



Unit 9 Lesson 6 Cofunctions

THEOREM: The sine of any acute angle is equal to the cosine of its complement.

1. $\sin(x) = \cos 63$

2. $\sin 34 = \cos x$

3. $\sin(2x - 1) = \cos 11$

4. $\sin(x + 5)^\circ = \cos(4x + 10)^\circ$

5. $\sin\left(\frac{1}{2}x\right)^\circ = \cos(x + 24)^\circ$

Procedure if variable is part of an ANGLE:

1. Add angles and set them = 90
2. Solve for x

Procedure if variable is part of the VALUE OF THE TRIG FUNCTION

1. Set expressions =

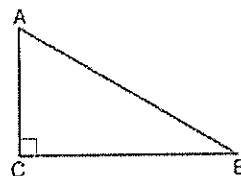
6. In right triangle ABC with right angle at C, $\sin A = 3x + 4$ and $\cos B = 2x + 10$. Find the value of x. Explain your answer.

7. In right triangle ABC with right angle at C, $\sin A = 2x + 0.1$ and $\cos B = 4x - 0.7$. Find the value of x. Explain your answer.

Regents Questions

8. Which expression is always equivalent to $\sin x$ when $0^\circ < x < 90^\circ$?
- 1 $\cos(90^\circ - x)$
 - 2 $\cos(45^\circ - x)$
 - 3 $\cos(2x)$
 - 4 $\cos x$

9. In scalene triangle ABC shown in the diagram below, $m\angle C = 90^\circ$.



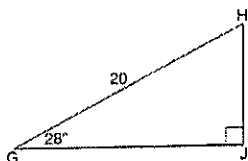
Which equation is always true?

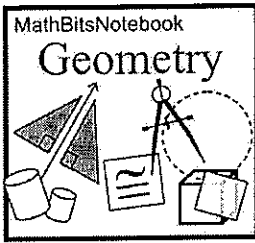
10

When instructed to find the length of \overline{HJ} in right triangle HJG , Alex wrote the equation

$\sin 28^\circ = \frac{HJ}{20}$ while Marlene wrote $\cos 62^\circ = \frac{HJ}{20}$. Are both students' equations correct?

Explain why.





Sine & Cosine of Complementary Angles

Name _____

Directions: Be sure to show your work.

1. a) Explain why $\sin(x) = \cos(90 - x)$ when x represents an acute angle.

b) Is it ever possible that $\sin(x) = \cos(x)$? Explain your answer.

2. In right $\triangle ABC$, $m\angle C = 90^\circ$, if $\sin A = m$, find $\cos B$.

3. Solve for θ (angles are acute):

a) $\cos 60^\circ = \sin \theta$

b) $\sin 71^\circ = \cos \theta$

c) $\sin \theta = \cos (\theta + 20)$

d) $\sin (\theta - 60) = \cos \theta$

4. Given right triangle ABC with right angle C , and $\sin A = \frac{1}{4}$. Which of the following expressions are

also equal to $\frac{1}{4}$? Select all that apply.

1. $\cos(A)$

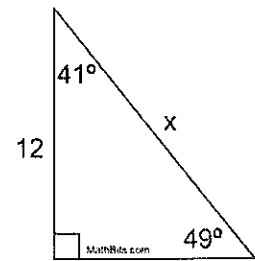
2. $\cos(B)$

3. $\cos(90^\circ - A)$

4. $\cos(90^\circ - B)$

5. $\sin(B)$

5. In attempting to solve for x in the problem at the right, students responded with a variety of equations. Which, if any, of the following equations are correct? Select all that apply.



1. $\sin 49^\circ = \frac{x}{12}$

2. $\cos 41^\circ = \frac{12}{x}$

3. $\sin 41^\circ = \frac{x}{12}$

4. $\cos 49^\circ = \frac{12}{x}$

5. $\sin 49^\circ = \frac{12}{x}$

6. None are true.

6. In right $\triangle ABC$, $m\angle C = 90^\circ$, $\cos A = \frac{1}{5}$. What is $\sin B$?

7. In right $\triangle ABC$, $m\angle C = 90^\circ$. Simplify the following expression: $\frac{\sin A - \cos B}{2}$

8. Given that $\sin(x + 10)^\circ = \cos(3x + 20)^\circ$, find the number of degrees in the acute angles of the corresponding right triangle.

9. In right $\triangle ABC$, $m\angle C = 90^\circ$, $\sin A = 3x - 0.6$ and $\cos B = 4x - 0.9$. Find x .

10. In right $\triangle ABC$, $m\angle C = 90^\circ$ and $m\angle A$ does not equal the $m\angle B$. If $\sin A = m$ and $\cos A = k$, express the value of $\cos B + \sin B$.

Right Triangle Review

Name: _____

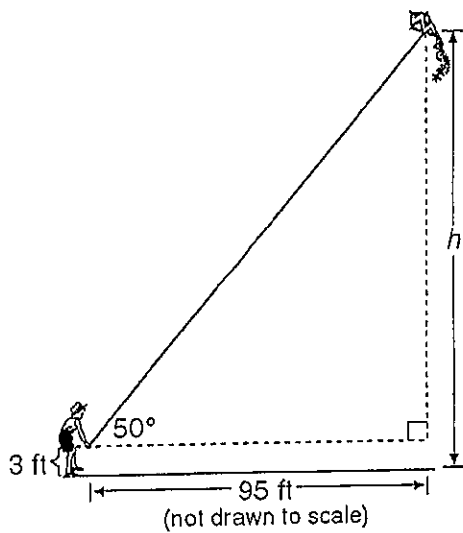
- ___ 1) The dimensions of a rectangle are 7 centimeters by 24 centimeters. Find, in centimeters, the length of the diagonal of this rectangle.
- ___ 2) Find, in simplest radical form, the length of a diagonal of a square whose side is 2.
- ___ 3) Triangle ABC is a right triangle with legs that measure 7 and 8. The length of the hypotenuse is
A) 9
B) 19
C) $\sqrt{15}$
D) $\sqrt{113}$
- ___ 4) If the hypotenuse of a right triangle measures 8 and one leg measures 5, then the other leg measures
A) $\sqrt{39}$
B) $\sqrt{13}$
C) $\sqrt{3}$
D) $\sqrt{89}$
- ___ 5) What is the length of the altitude of an equilateral triangle whose side has length 4?
A) 2
B) 4
C) $4\sqrt{3}$
D) $2\sqrt{3}$
- ___ 6) Which set of numbers may represent the lengths of the sides of a right triangle?
A) {4,5,6}
B) {5,12,13}
C) {5,5,10}
D) {7,8,10}
- ___ 7) The length of a side of a rhombus whose diagonals are 6 and 8 is
A) 9
B) 5
C) 6
D) 8
- ___ 8) The perimeter of a rhombus is 40 and the shorter diagonal is 12. Find the length of the *longer* diagonal.
- ___ 9) If the diagonal of a square has a length of $4\sqrt{2}$, find the perimeter.
- ___ 10) In a right triangle, the length of the longer leg is 2 more than the length of the shorter leg. The length of the hypotenuse is 2 less than twice the length of the shorter leg. Find the lengths of the sides of the triangle.
- ___ 11) If $\sin(x + 20^\circ) = \cos x$, then the value of x is
A) 70
B) 55
C) 35
D) 45
- ___ 12) If $\cos(2x - 1)^\circ = \sin(3x + 6)^\circ$, then the value of x is
A) 17
B) -7
C) 71
D) 35

13) Which value of x satisfies the equation $\sin(3x + 5)^\circ = \cos(4x + 1)^\circ$?

- A) 12
 B) 30
 C) 24
 D) 4

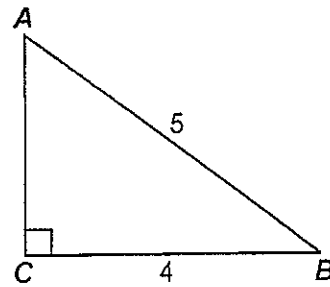
14) What is the degree measure of an acute angle θ if $\sin 20^\circ = \cos \theta$?

15) Joe is holding his kite string 3 feet above the ground, as shown in the accompanying diagram. The distance between his hand and a point directly under the kite is 95 feet.



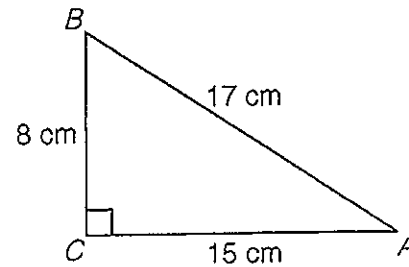
If the angle of elevation to the kite is 50° , find the height, h , of his kite, to the nearest foot.

16) Which equation could be used to find the measure of one acute angle in the right triangle shown below?



- A) $\tan A = \frac{5}{4}$
 B) $\sin A = \frac{4}{5}$
 C) $\tan B = \frac{4}{5}$
 D) $\cos B = \frac{5}{4}$

17) Which equation shows a correct trigonometric ratio for angle A in the right triangle below?

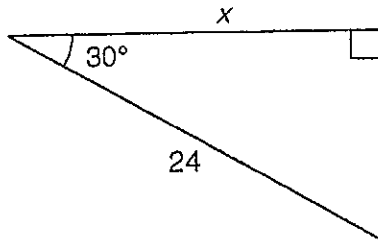


- A) $\tan A = \frac{15}{8}$
 B) $\cos A = \frac{15}{17}$
 C) $\sin A = \frac{15}{17}$
 D) $\tan A = \frac{8}{17}$

18) In $\triangle ABC$, the measure of $\angle B = 90^\circ$, $AC = 50$, $AB = 48$, and $BC = 14$. What ratio represents the tangent of $\angle A$?

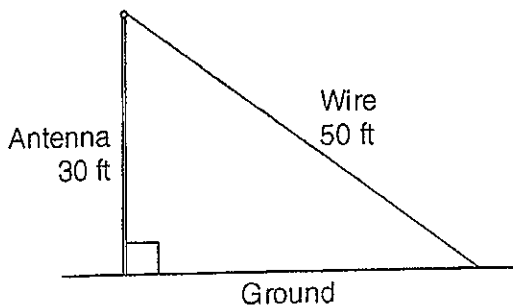
- A) $\frac{48}{50}$
 B) $\frac{14}{15}$
 C) $\frac{48}{14}$
 D) $\frac{14}{48}$

19) In the right triangle below, what is the value of x to the nearest whole number?



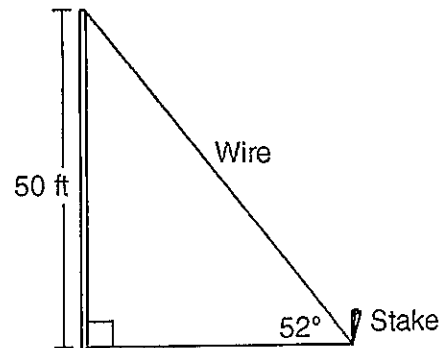
- A) 21
- B) 12
- C) 14
- D) 28

20) A communications company is building a 30-foot antenna to carry cell phone transmissions. As shown in the diagram below, a 50-foot wire from the top of the antenna to the ground is used to stabilize the antenna.



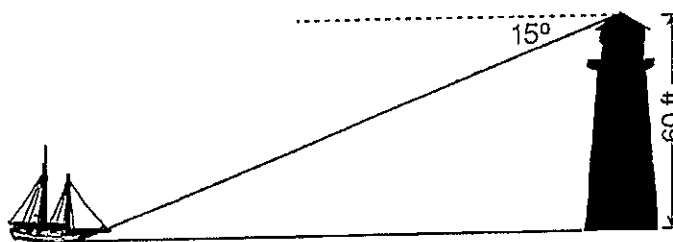
Find, to the nearest degree, the measure of the angle that the wire makes with the ground. [Show all work.]

21) A stake is to be driven into the ground away from the base of a 50-foot pole, as shown in the diagram below. A wire from the stake on the ground to the top of the pole is to be installed at an angle of elevation of 52° .

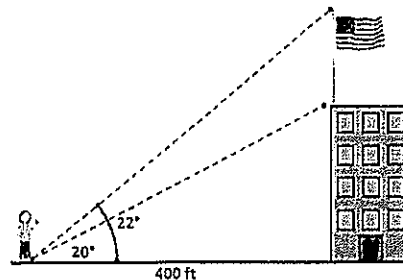


- (a) How far away from the base of the pole should the stake be driven in, to the nearest foot? [Show all work.]
- (b) What will be the length of the wire from the stake to the top of the pole, to the nearest foot? [Show all work.]

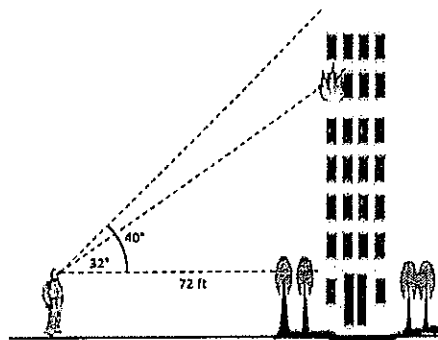
22) As shown in the accompanying diagram, a ship at sea is sighted from the top of a 60-foot lighthouse. If the angle of depression of the ship from the top of the lighthouse measures 15° , find, to the nearest foot, how far the ship is from the base of the lighthouse.



23. A flagpole is at the top of a building. 400 ft from the base of the building, the angle of elevation of the top of the pole is 22° and the angle of elevation of the bottom of the pole is 20° . Determine the length of the flagpole (to the nearest foot).

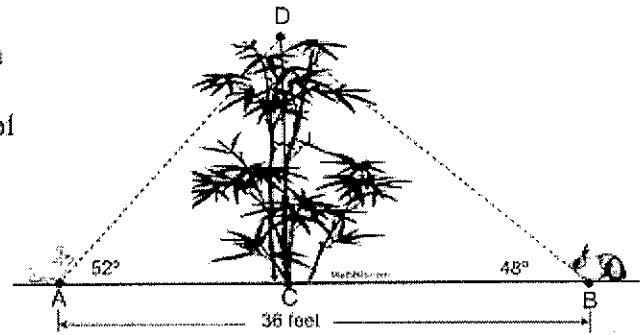


24. A firefighter on the ground sees the fire break through a window. The angle of elevation to the windowsill is 32° . The angle of elevation to the top of the building is 40° . If the firefighter is 72 ft from the building, what is the distance from the roof to the window sill?

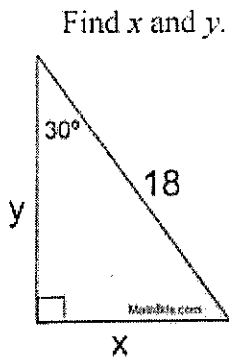


25.

Rabbit A and rabbit B are sitting 36 feet apart. Between them is their home (rabbit hole C) beneath a bamboo tree. From point A , the angle of elevation of the top of the tree is 52° , and from point B the angle of elevation of the top of the tree is 48° . Find, to the nearest tenth of a foot, the height of the tree.



26. Simplest Radical Form



27. Simplest Radical Form

