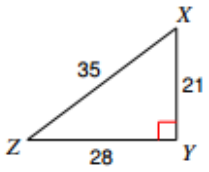
Day 1 HW

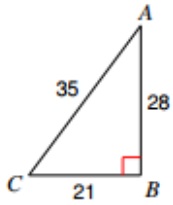
Find the value of each trigonometric ratio. Write as a simplified fraction.

1) tan Z

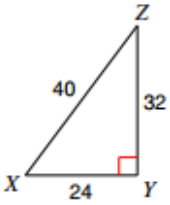


2) cos C

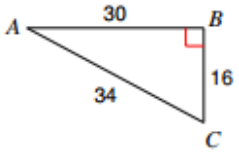
3) sin C



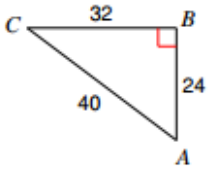
4) tan X



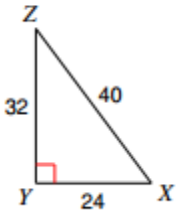
5) cos A



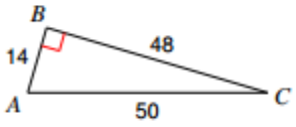
6) sin A



7) sin Z

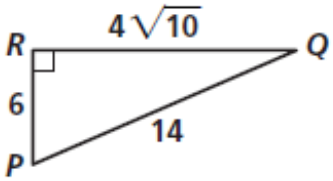


8) sin C



Write the ratios for sinP, cosP, and tanP. Remember to simplify in **radical form**! No decimals!

9.



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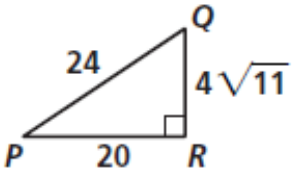

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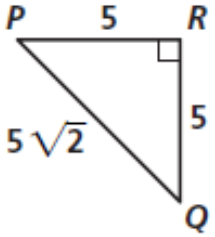
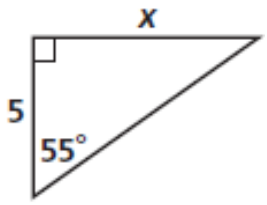


Find the value of x. Round segments to the nearest tenth and angles to the nearest degree.

1.



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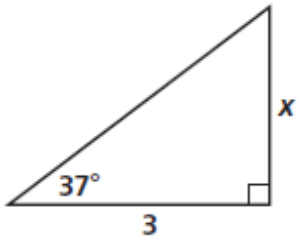

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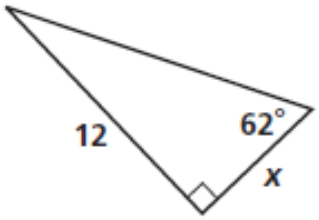

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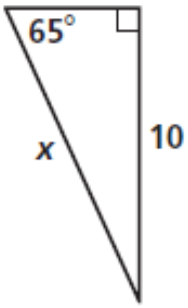

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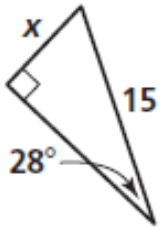

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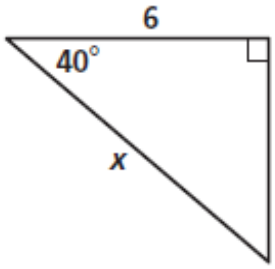

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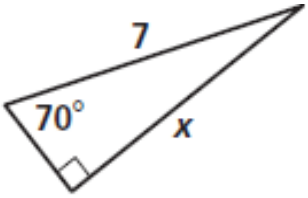

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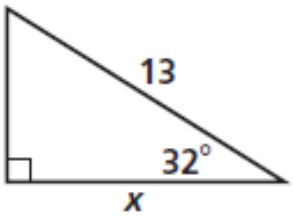

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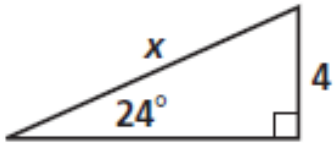
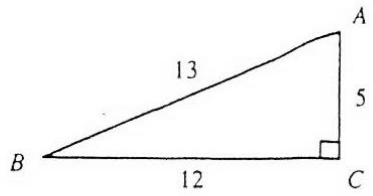


Day 2 HW

The Sine, Cosine, and Tangent Ratios

Use the diagram to express the ratio as a fraction.

1. $\sin A =$ _____
2. $\cos A =$ _____
3. $\cos B =$ _____
4. $\tan A =$ _____
5. $\tan B =$ _____
6. $\sin B =$ _____



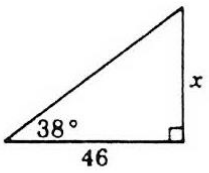
Exs. 1–6

Complete. Use a scientific calculator or the table on page 311 of the text.

7. $\sin 3° \approx$ _____
8. $\cos 30° \approx$ _____
9. $\tan 48° \approx$ _____
10. $\sin 79° \approx$ _____
11. $\cos$ _____ ≈ 0.9455
12. $\sin$ _____ ≈ 0.8746
13. $\tan$ _____ ≈ 2.4751
14. $\cos$ _____ ≈ 0.6428

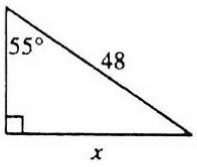
Use a scientific calculator or the table on page 311 of the text to find the values of the variables. Find lengths correct to the nearest integer and angles to the nearest degree.

15.



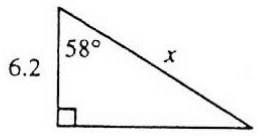
$x \approx$ _____

16.



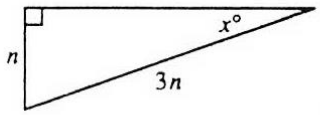
$x \approx$ _____

17.



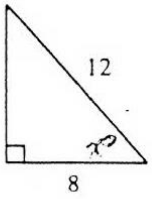
$x \approx$ _____

18.



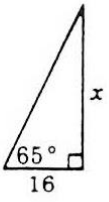
$x \approx$ _____

19.



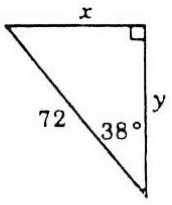
$x \approx$ _____

20.



$x \approx$ _____

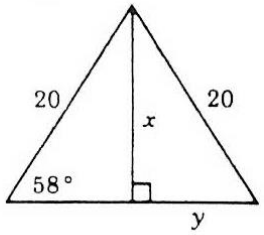
21.



$x \approx$ _____

$y \approx$ _____

22.



$x \approx$ _____

$y \approx$ _____

Trigonometry Worksheet

For each problem: 1) Sketch a diagram.
2) Set up the equation.
3) Solve (round to the nearest tenth)

1) The angle of elevation from a ship to the top of a 70-foot lighthouse on the coast measures 26 degrees. How far from the coast is the boat?

2) The diagonal of a rectangle is 6 inches long. It makes an angle of 55 degrees with the side of the rectangle. Find the dimensions of the rectangle.

3) Two sides of a triangle measure 8 inches and 11 inches. The included angle measures 34 degrees. Find the measure of the altitude to the 11 inch side.

4) A kite is flying at the end of a 150 foot string. The string makes an angle of 75 degrees with the ground. How high above the ground is the kite?

5) A 15m pole is leaning against the wall. The foot of the pole is 10m from the base of the wall. Find the measure of the angle that the pole makes with the ground.

6) A small airplane climbs at an angle of 8° with the ground. Find the horizontal distance it has flown when it reaches an altitude of 800m.

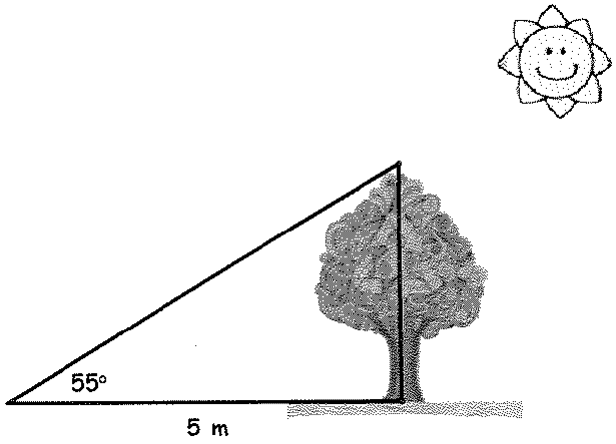
7) A cliff is 100m above sea level. From the cliff, the angle of depression to a boat below is 58°. How far is the boat from the base of the cliff?

8) A Martian at the top of a 25m building spies a car at a 48° angle of depression. How far does he have to shoot his ray-gun to hit the car?

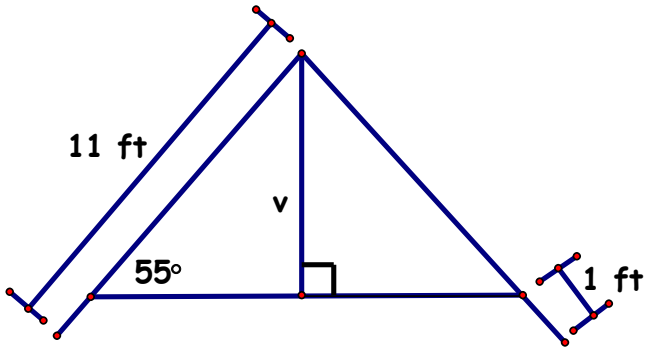
Day 3 HW

Basic Trigonometry Problems

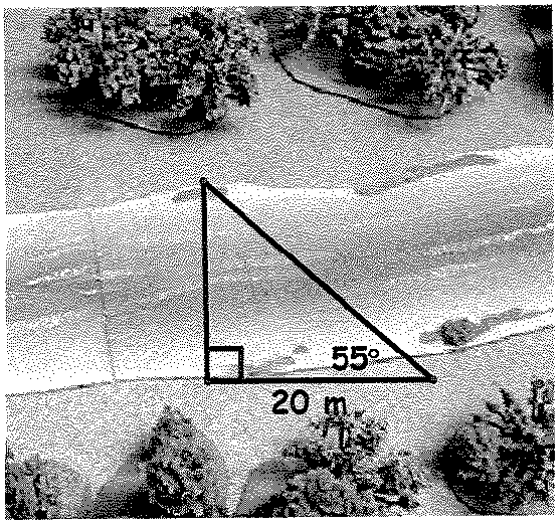
1. How tall is the tree?



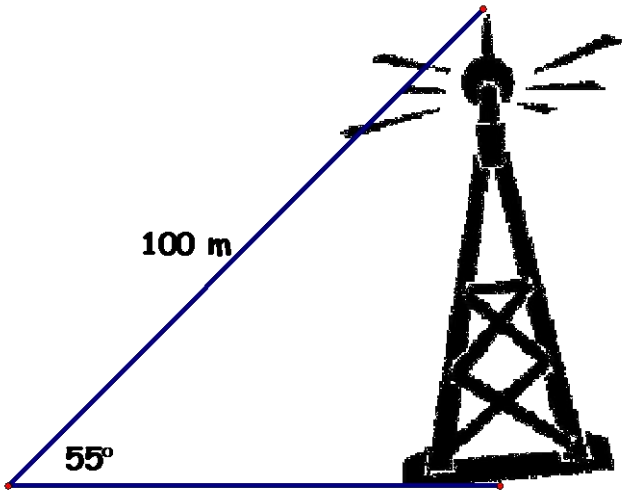
2. What is the height, v, of the roof?



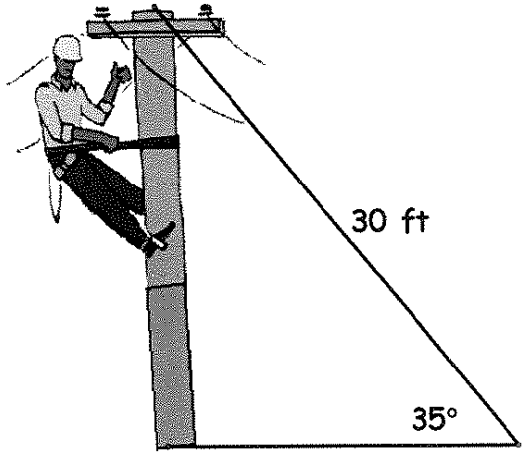
3. How wide is the river?



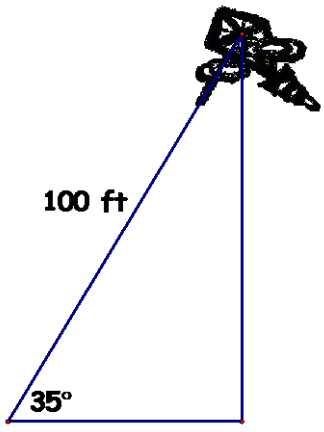
4. How tall is the tower?



5. How tall is the telephone pole?



6. How far above the ground is the kite?



Triangle Trigonometry Word Problems

(Draw pictures and show work! Round to the nearest tenth)

1. **From a point on level ground 80 feet from the base of the Eiffel Tower, the angle of elevation is 85.4°. Approximate the height of the Eiffel Tower to the nearest foot.**

2. **To measure the height of cloud cover, a meteorology student shines a spotlight vertically up from the ground to the clouds. Using a transit from 1000 meters away, he measures the angle from level ground to the spotlight beam on the clouds and finds it to be 59°. Approximate the height of the cloud cover.**

3. **A guy wire is 13.8 yards long and is attached from the ground to a pole 6.7 yards above the ground. Find the angle, to the nearest tenth of a degree that the wire makes with the ground.**

4. **At a certain time of day, the angle of elevation of the sun is** 40°. **To the nearest foot, find the height of a tree whose shadow is 35 feet long.**

5. **Jane has a 32 ft. ladder. If she leans it against a building, the angle of elevation is 70 degrees. How high up the building will the top of the ladder be?**

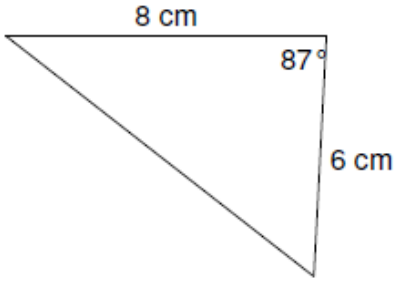
6. **A dog chased a cat up a tree. The cat is 14 feet up the tree. The angle of depression from the cat to the dog is 36 degrees. How far is the dog from the tree?**

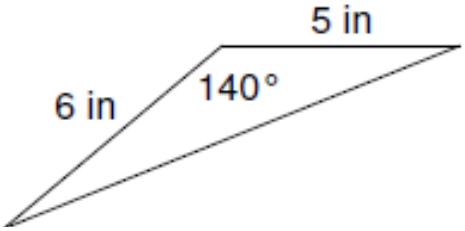
7. **A building 240 feet tall casts a 30 foot long shadow. If a person stands at the end of the shadow and looks up to the top of the building, what is the angle of the person's eyes to the top of the building (to the nearest hundredth of a degree)? (Assume the person's eyes are 4 feet above ground level.)**

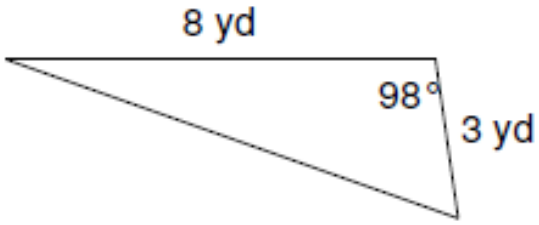
8. **A surveyor standing 55 meters from the base of a building measures the angle to the top of the building and finds it to be 37°. How tall is the building?**

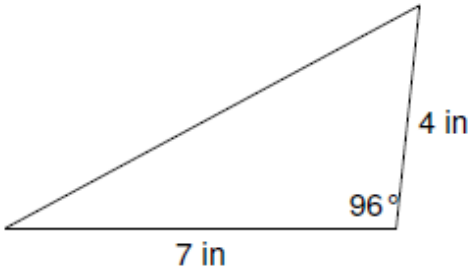
Day 4 HW – Law of Sines, Finding Area with Sine

Find the area of each triangle. Round your answers to the nearest tenth.

1) 

2) 

3) 

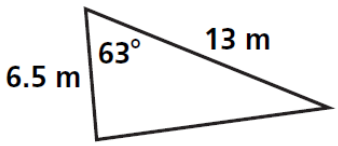
4) 

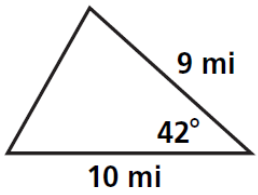
5) A triangle with two sides that measure 6 yd and 2 yd with an included angle of 10°.

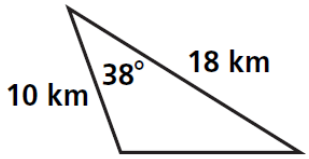
6) A triangle with two sides that measure 6 m and 8 m with an included angle of 137°.

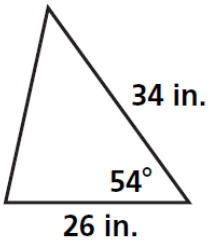
7) A triangle with two sides that measure 5 cm and 8 cm with an included angle of 39°.

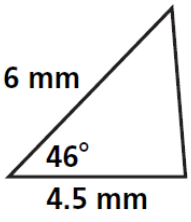
8) A triangle with two sides that measure 8 ft and 7 ft with an included angle of 30°.

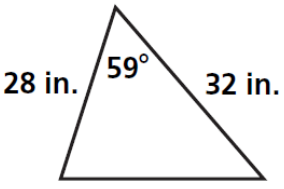
9. 

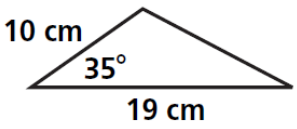
10. 

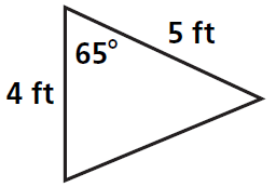
11. 

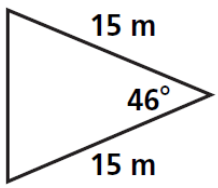
12. 

13. 

14. 

15. 

16. 

17. 

Trigonometry: The Law of Sines

The LAW OF SINES is a powerful triangle tool which is used to find missing **sides** or **angles** of ANY triangle. By matching up angles with their **opposite sides**, the equation is:

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

Example: Find the missing side x:

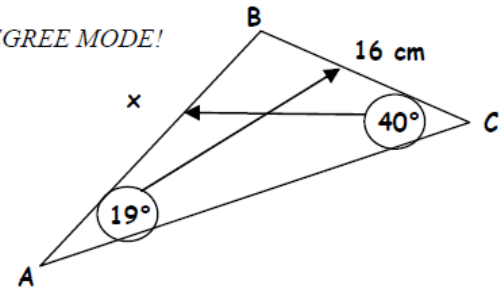
How about finding the other unknowns?

$$\frac{\sin 19^o}{16} = \frac{\sin 40^o}{x} \quad \textit{DEGREE MODE!}$$

$$\frac{.326}{16} = \frac{.643}{x}$$

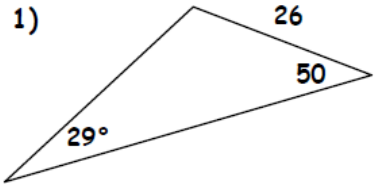
$$.326x = 10.288$$

$$x = 31.56 \text{ cm}$$

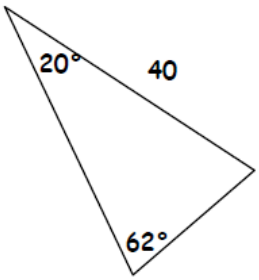


Solve each triangle:

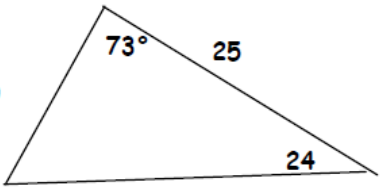
1)



2)



3)



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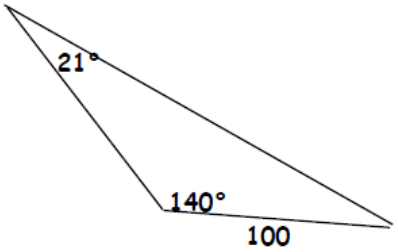
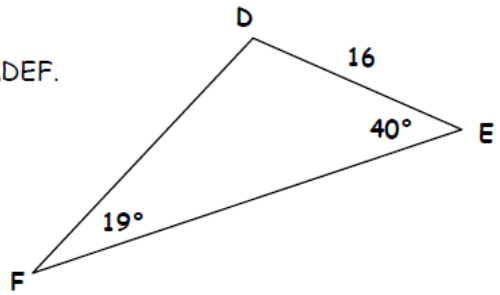


5) Find the perimeter of ΔDEF.

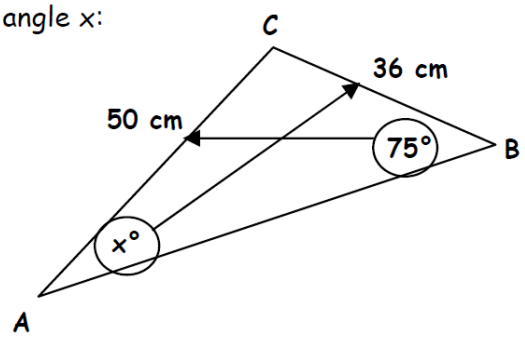


This worksheet was adapted from http://www.bgsd.k12.wa.us/riv/homework/Geometry/LawOfSines.doc

Day 5 HW – Law of Sines Special Cases

The LAW OF SINES can also be used to find missing angles.

Example: Find the missing angle x:



What about the other unknowns?

$$\frac{\sin x^o}{36} = \frac{\sin 75^o}{50}$$

$$\frac{\sin x^o}{36} = \frac{.966}{50}$$

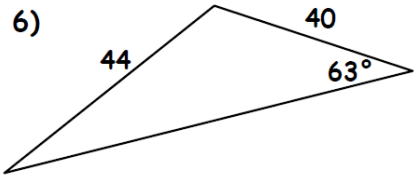
$$50(\sin x^o) = 34.776$$

$$\sin x^o = .69532$$

$x = 44^o$ (using inverse sine on your calculator)

Solve each triangle: Round to the nearest tenth.

6)



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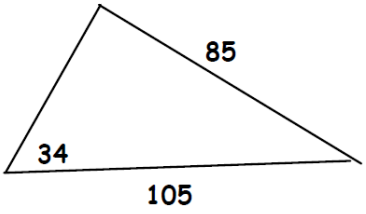

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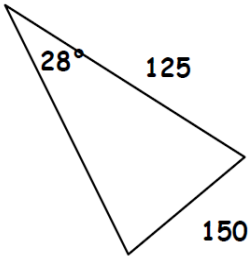

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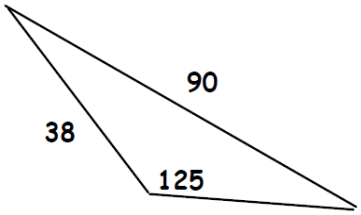


Solve each ΔPQR described below. Round to the nearest tenth.

10) p = 27, q = 40, m∠P = 33

12) q = 12, r = 11, m∠R = 16

11) m∠P = 89, p = 16, r = 12

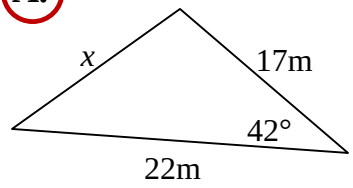
13) m∠P = 14, m∠Q = 99, r = 14

Day 6 HW – Law of Cosines

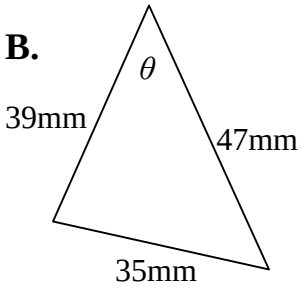
Complete the Circled Problems below!!

1. Solve for the unknown in each triangle. Round to the nearest hundredth.

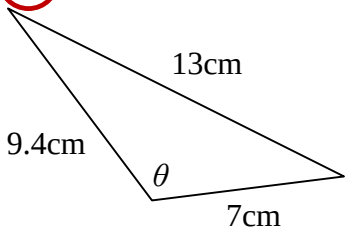
A.



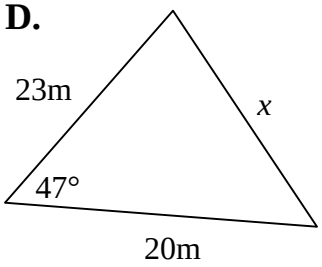
B.



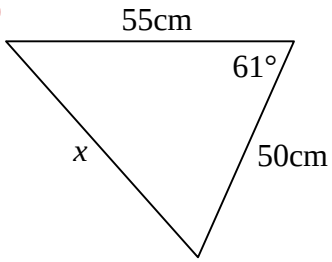
C.



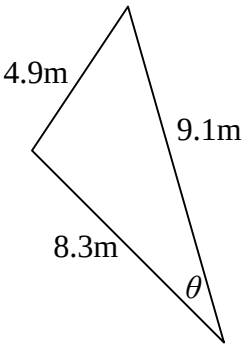
D.



E.



F.



2. Solve for **all** missing sides and angles in each triangle. Round to the nearest hundredth.
** USE PROPER VARIABLES

A. $\Delta XYZ:\quad x=29m,\ y=15m,\ m\angle Z=122°$

B. $\Delta GHI:\quad g=13cm,\ h=8cm,\ i=15cm$

C. $\Delta MNO:\quad n=31m,\ o=28m,\ m\angle M=62°$

3. A triangle has sides equal to 4 m, 11 m and 8 m. Find its angles (round answers to nearest tenth)

4. A ship leaves port at 1 pm traveling north at the speed of 30 miles/hour. At 3 pm, the ship adjusts its course on a bearing of N 20º E. How far is the ship from the port at 4pm? (round to the nearest unit).

5. Find the area of the triangle whose sides are 12cm., 5cm. and 13cm.

Read this page And add anything to your notes if necessary ☺

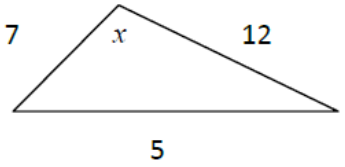
Law of Sines and Law of Cosines

Law of Sines: $\frac{a}{\sin a} = \frac{b}{\sin b} = \frac{c}{\sin c}$ or $\frac{\sin a}{a} = \frac{\sin b}{b} = \frac{\sin c}{c}$

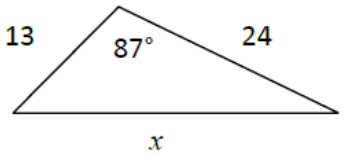
Law of Cosines: $a^2 = b^2 + c^2 - 2bc\cos A$

Law of Cosines is the best choice if:

Case1: The length of all three sides of a triangle are know and you are trying to find an angle:

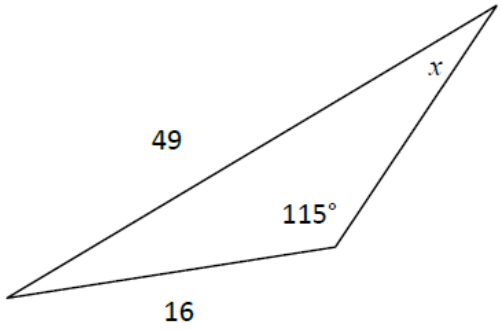


Case 2: Two sides and an enclosed angle are know and you are trying to find the side opposite the angle:

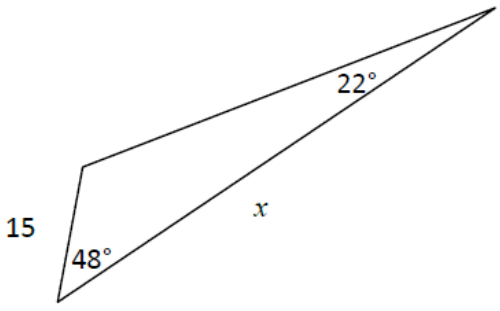


Law of Sines is the best choice if:

Case 3: Two sides and an angle opposite one of those sides is know and you are trying to find the other angle(s):



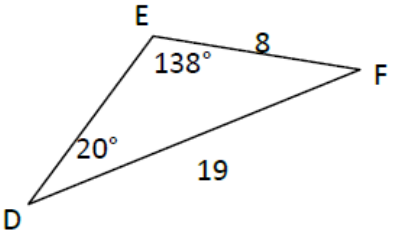
Case 4: Two angles and one side are known and your are trying to find the missing side(s):



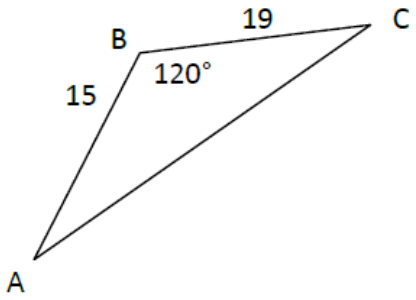
In general Law of Sines is easier to use so always check to see if you can use it first.

III. Use the Law of Sines and Law of Cosines to find missing dimensions.

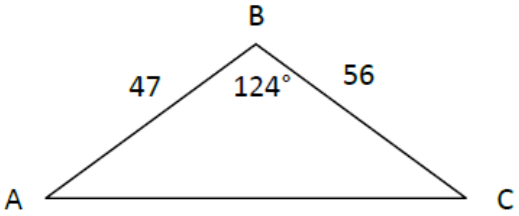
11. Find the missing dimensions of the triangle below. Round your answers to the nearest whole number.



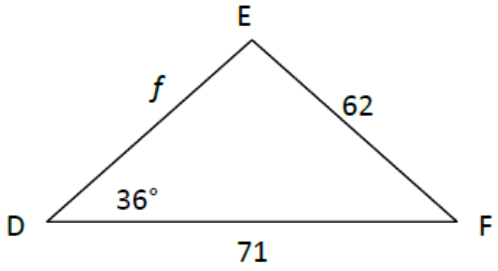
12. Find the m∠C to the nearest whole degre



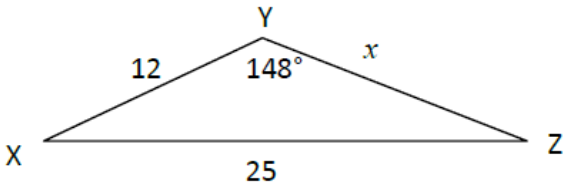
13. Find the missing dimensions of the triangle below. Round your answers to the nearest whole number.



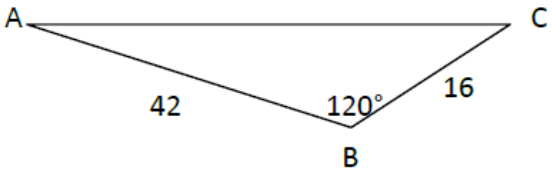
14. Find the f to the nearest whole number.



15. Find the x to the nearest whole number.

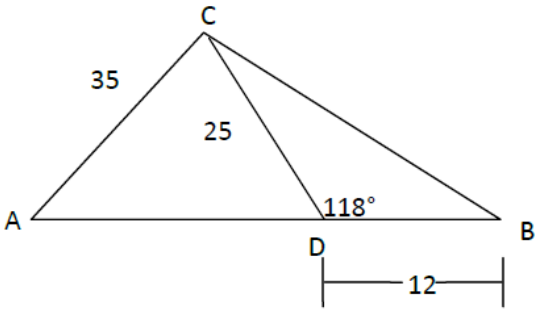


16. Find the m∠A to the nearest whole degree.

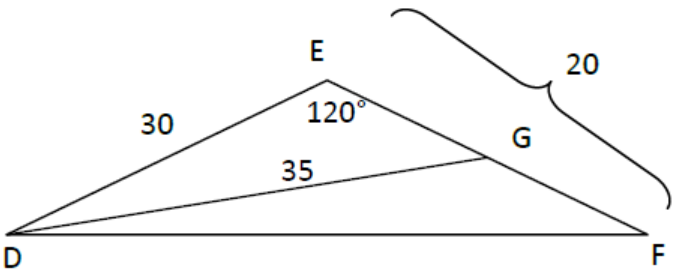


IV. Challenge Problems

17. Find the m∠A to the nearest whole degree.



18. Find the m∠DGF to the nearest whole degree.



The Law of Cosines

In $\triangle RST$, given the following measures, find the measure of the missing side.

1. $r = 5, s = 8, m\angle T = 39$

2. $r = 6, t = 11, m\angle S = 87$

3. $r = 9, t = 15, m\angle S = 103$

4. $s = 12, t = 10, m\angle R = 58$

In $\triangle HIJ$, given the lengths of the sides, find the measure of the stated angle to the nearest tenth.

5. $h = 12, i = 18, j = 7; m\angle H$

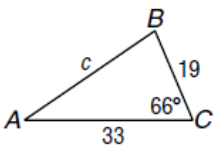
6. $h = 15, i = 16, j = 22; m\angle I$

7. $h = 23, i = 27, j = 29; m\angle J$

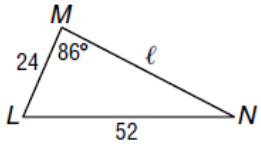
8. $h = 37, i = 21, j = 30; m\angle H$

Determine whether the Law of *Sines* or the Law of *Cosines* should be used first to solve each triangle. Then solve each triangle. Round angle measures to the nearest degree and side measures to the nearest tenth.

9.



10.



11. $a = 10, b = 14, c = 19$

12. $a = 12, b = 10, m\angle C = 27$

Solve each $\triangle RST$ described below. Round measures to the nearest tenth.

13. $r = 12, s = 32, t = 34$

14. $r = 30, s = 25, m\angle T = 42$

15. $r = 15, s = 11, m\angle R = 67$

16. $r = 21, s = 28, t = 30$

The Law of Cosines

In $\triangle JKL$, given the following measures, find the measure of the missing side.

1. $j = 1.3, k = 10, m\angle L = 77$

2. $j = 9.6, \ell = 1.7, m\angle K = 43$

3. $j = 11, k = 7, m\angle L = 63$

4. $k = 4.7, \ell = 5.2, m\angle J = 112$

In $\triangle MNQ$, given the lengths of the sides, find the measure of the stated angle to the nearest tenth.

5. $m = 17, n = 23, q = 25; m\angle Q$

6. $m = 24, n = 28, q = 34; m\angle M$

7. $m = 12.9, n = 18, q = 20.5; m\angle N$

8. $m = 23, n = 30.1, q = 42; m\angle Q$

Determine whether the Law of Sines or the Law of Cosines should be used first to solve $\triangle ABC$. Then sole each triangle. Round angle measures to the nearest degree and side measure to the nearest tenth.

9. $a = 13, b = 18, c = 19$

10. $a = 6, b = 19, m\angle C = 38$

11. $a = 17, b = 22, m\angle B = 49$

12. $a = 15.5, b = 18, m\angle C = 72$

Solve each $\triangle FGH$ described below. Round measures to the nearest tenth.

13. $m\angle F = 54, f = 12.5, g = 11$

14. $f = 20, g = 23, m\angle H = 47$

15. $f = 15.8, g = 11, h = 14$

16. $f = 36, h = 30, m\angle G = 54$

17. REAL ESTATE The Esposito family purchased a triangular plot of land on which they plan to build a barn and corral. The lengths of the sides of the plot are 320 feet, 286 feet, and 305 feet. What are the measures of the angles formed on each side of the property?

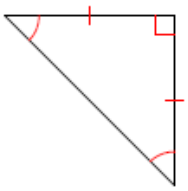
Day 7 Homework: Classifying Triangles and their parts

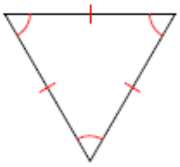
Answer each question with *never*, *sometimes*, or *always.*

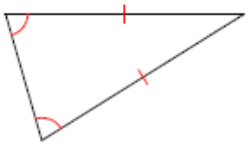
1. *Right* triangles can be obtuse triangles. _____
2. *Isosceles* triangles are *equilateral* triangles. _____
3. *Equilateral* triangles are *isosceles* triangles. _____
4. *Obtuse* triangles have *more than* one obtuse angle. _____
5. *Equilateral* triangles have the same angle measure. _____
6. *Isosceles* triangles are acute triangles. _____
7. I can use the term *equilateral* when referring to *equiangular* triangles. _____
8. *Acute* triangles are *equiangular*. _____
9. *Isosceles* triangles are *right* triangles. _____
10. The angles in *scalene* triangles are different. _____
11. A scalene triangle is an acute triangle. _____
12. An equilateral triangle is a scalene triangle. _____

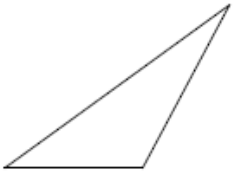
Classify each triangle by its angles and sides. Equal sides and equal angles, if any, are indicated in each diagram.

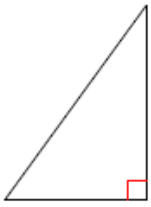
13) 

14) 

15) 

16) 

17) 

18) 

Sketch an example of the type of triangle described. Label the sides and angles with realistic measurements. If no triangle can be drawn, write "not possible."

19) right isosceles

20) acute scalene

21) right scalene

22) equilateral

23) scalene isosceles

24) acute right

25) right obtuse

26) right equilateral