Solve applied problems using the attributes of similar triangles.
Solve problems using ratio and proportions.
Investigate the fundamental concepts behind trigonometry: three basic trig functions and how to determine which trig function to use.
Know that recognizing special right triangles (30, 60 and 90) in geometry can help you to problem solve.

Content Objective Content Objective Content Objective Content Objective Content Objective Content Objective Content Objective Content Objective Content Objective

Week 7, Lesson 1

1. Warm-up
2. ICA
3. Quiz
4. Extra Practice:

Language Objectives

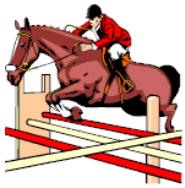
I will discuss with the members of my group how to solve real-world problems involving triangles.

I will demonstrate how to solve triangle problems using similar triangles and trigonometry when appropriate.

Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up

Warm-up: Answer the following questions.

There are 12 horses in a horse show competition. The top three winning horses receive money. How many possible money winning orders are there for a competition with 12 horses?



Choose:

- 36
- 120
- 1200
- 1320

How many different 4 letter words can be formed from the letters in the word MATH ?

Choose:

- 8
- 16
- 24
- 32

A permutation is an arrangement of objects in specific order.

The order of the arrangement is important!!

The notation for a permutation:

$${}_nP_r$$

n is the **total** number of objects

r is the number of objects chosen (want)

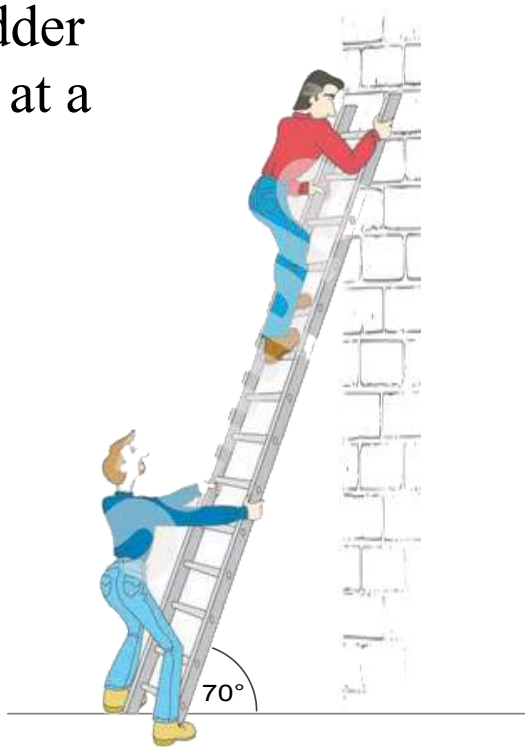
The formula for a permutation:

$${}_nP_r = \frac{n!}{(n-r)!}$$

(Remember that 0! = 1.)

How far up the wall will the ladder reach if it is placed 4 feet away at a 70° angle?

- Draw the picture (triangle)
- Label all sides
- Write all 3 trig ratios
- Solve



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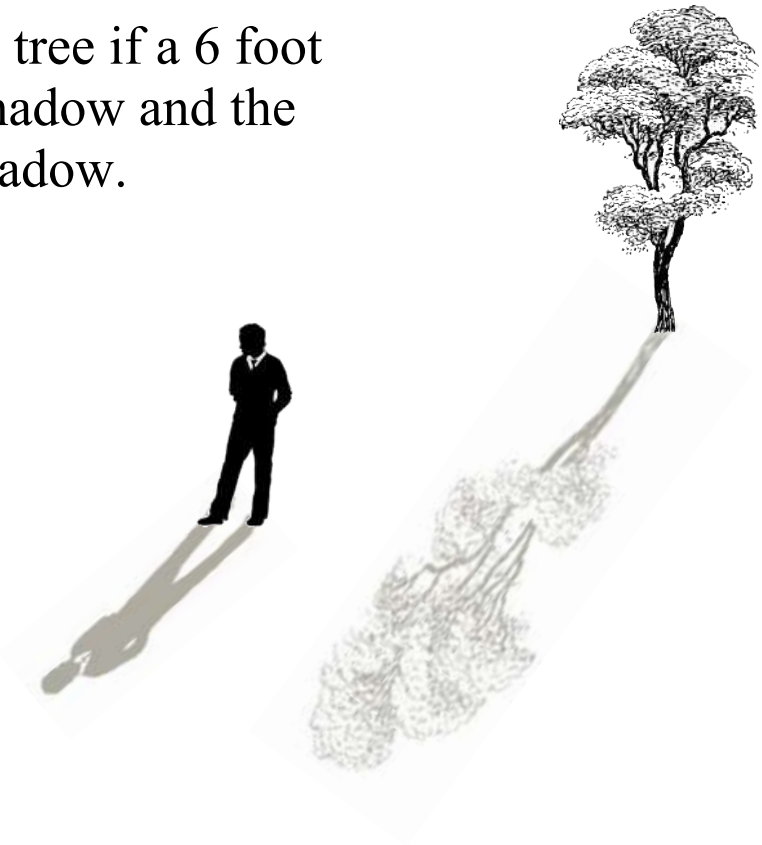
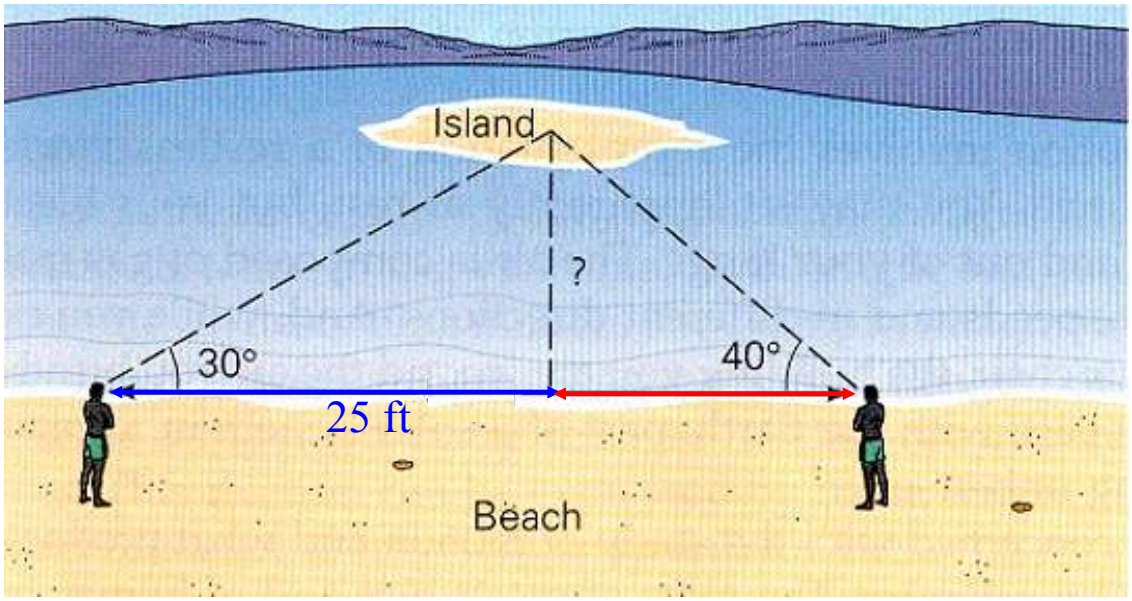
Find the height of the tree if a 6 foot man casts a 10 foot shadow and the tree casts a 25 foot shadow.

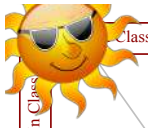
- Draw the picture (triangles)
- Label all sides
- Trig or Proportions?
- Solve



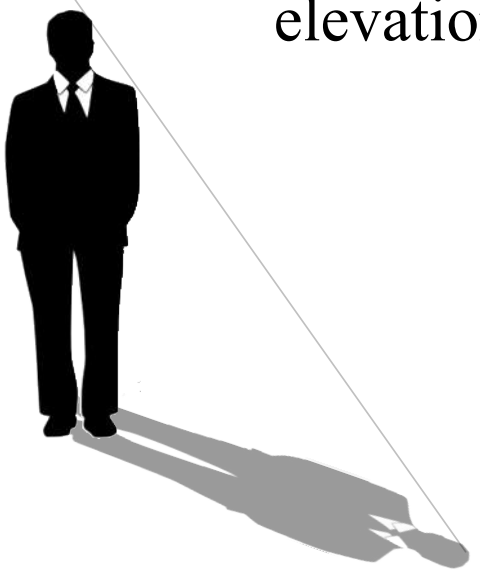
Find the missing value. Find the perimeter.



- Draw the picture (triangles)
- Label all sides
- Trig or Proportions?
- Solve



A man is 6' tall. Find the length of his shadow if the angle of elevation of the sun is 30°.



- Draw the picture (triangles)
- Label all sides
- Trig or Proportions?
- Solve

A ladder is placed 5 feet from a wall and reaches 12 feet up the wall, how long is the ladder?

What degree does the ladder form with the ground?

With the wall?

Solve applied problems using the attributes of similar triangles.
Solve applied problems using trigonometry.

Content Objective Content Objective Content Objective Content Objective Content Objective Content Objective Content Objective Content Objective Content Objective

Week 7, Lesson 2

1. Warm-up
2. ICA
3. Extra Practice

Language Objectives

I will discuss with the members of my group how to solve real-world problems involving triangles.

I will demonstrate how to solve triangle problems using similar triangles and trigonometry when appropriate.

Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up

Warm-up: Answer the following questions.

A ladder 6 feet long leans against a wall and makes an angle of 71° with the ground. Find to the *nearest tenth* of a foot how high up the wall the ladder will reach.

Draw a picture. Label your sides. Write all 3 trigonometric ratios. Solve.

Choose:

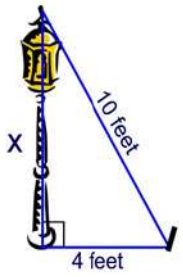
- 2.0 feet
- 3.5 feet
- 5.7 feet
- 6 feet

ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity

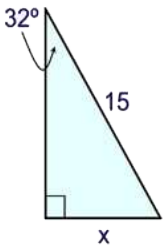
ICA: Show all work. Draw and label the picture.

Answer choices have been provided to give you some confidence in your solutions, not so you can just guess. Do your own work.

1. A light post, shown at the right, is set in concrete and supported with a guy wire while the concrete dries. The length of the guy wire is 10 feet and the ground stake is 4 feet from the bottom of the light post. Find the height of the light post.

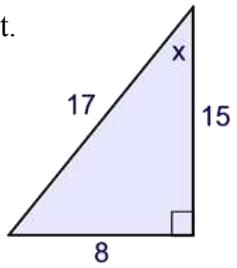


2. In the diagram shown at the right, what is the value of x to the *nearest whole number*?

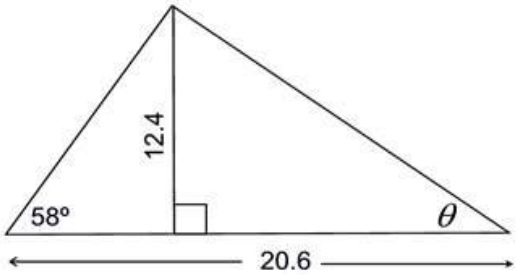


- [1] 8
- [2] 9
- [3] 10
- [4] 13

3. Find the value of x in the diagram at the right.



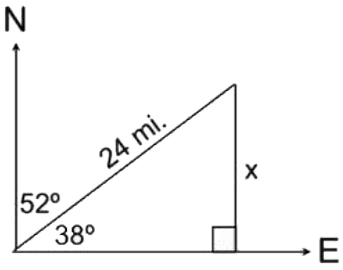
4. Find to the *nearest degree*, the number of degrees in the angle labeled θ in the diagram at the right.
(*Hint: this is a two step problem. Use the small triangle on the left to help find needed information.*)



- [1] 32°
- [2] 44°
- [3] 48°
- [4] 52°

5. If the legs of a right triangle are 28 units and 45 units, find the exact number of units in the hypotenuse.

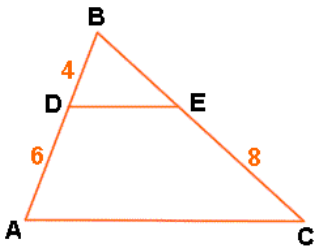
6. A plane has traveled 24 miles on a course heading 52° east of north. How far north (x) has the plane traveled at this point? Express answer to the *nearest hundredth* of a mile.



- [1] 12.94 miles
- [2] 14.78 miles
- [3] 18.91 miles
- [4] 21.72 miles

---

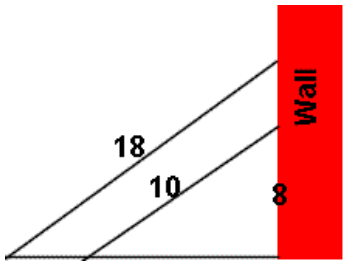
7. Given: In the diagram, is parallel to , $BD = 4$, $DA = 6$ and $EC = 8$. Find BC to the *nearest tenth*.



- 4.3
- 5.3
- 8.3
- 13.3

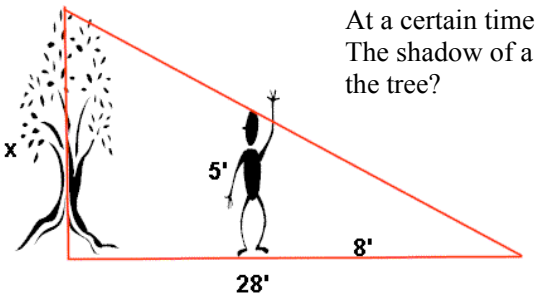
---

8. Two ladders are leaned against a wall such that they make the same angle with the ground. The 10' ladder reaches 8' up the wall. How much further up the wall does the 18' ladder reach?



- 4.5'
- 6.4'
- 14.4'
- 22.4'

9.



At a certain time of the day, the shadow of a 5' boy is 8' long. The shadow of a tree at this same time is 28' long. How tall is the tree?

- 8.5'
- 16'
- 17.5'
- 20'

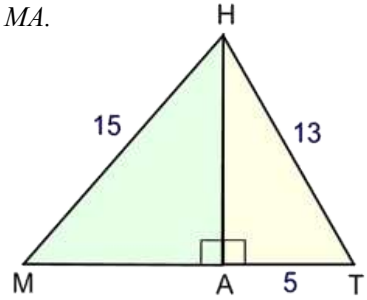
---

10. A vertical flagpole casts a shadow 12 feet long at the same time that a nearby vertical post 8 feet casts a shadow 3 feet long. Find the height of the flagpole in feet.

- **8**
- **12**
- **24**
- **32**

Extra Credit: Solve this problem, take a picture of it and email it to your teacher today.

In the diagram at the right, $MH = 15$, $HT = 13$, and $AT = 5$. Find MA.



Solve applied problems using the attributes of similar triangles.
Solve applied problems using trigonometry.

Content Objective Content Objective Content Objective Content Objective Content Objective Content Objective Content Objective Content Objective Content Objective

Week 7, Lesson 3

1. Warm-up
2. ICA
3. Extra Practice

Language Objectives

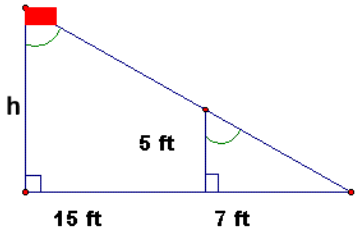
I will discuss with the members of my group how to solve real-world problems involving triangles.

I will demonstrate how to solve triangle problems using similar triangles and trigonometry when appropriate.

Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up

Warm-up: Find the height of the flag.

Draw a picture.
Label your sides.
Solve.

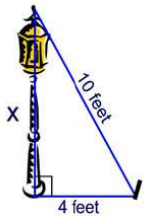


ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity

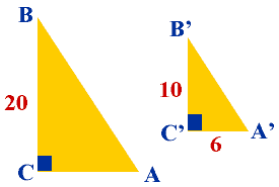
Answer choices have been provided to give you some confidence in your solutions, not so you can just guess. Do your own work.

ICA: Show all work. Draw and label the picture.

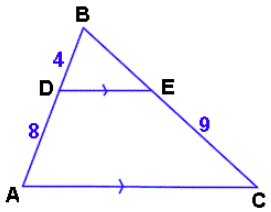
1. A light post, shown at the right, is set in concrete and supported with a guy wire while the concrete dries. Find, to the *nearest degree*, the angle of elevation of the top of the post made by the guy wire from the stake in the ground.
   - [1] 66°
   - [2] 24°
   - [3] 22°
   - [4] 64°



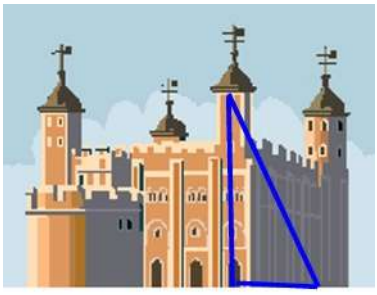
2. Given angle A and angle A' are each 59°, find AC.
   - 8
   - 10
   - 12
   - 18



3. Find BC.
   - 4
   - 4.5
   - 13.5
   - 17

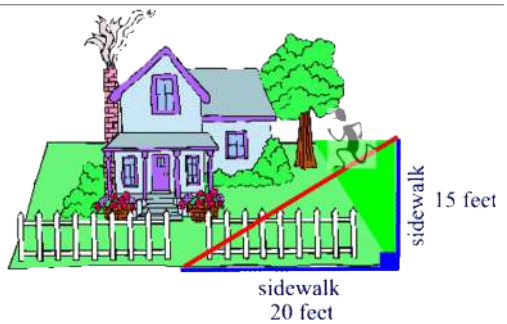


4. Princess Fiona is locked in the tower of Castle Kronen. You have volunteered to rescue the princess. If the tower window is 36 feet above the ground and you must place your ladder 10 feet from the base of the castle (because of the moat), which choice is the shortest length ladder you will need to reach the tower window?
   - 34 feet
   - 35 feet
   - 37 feet
   - 38 feet

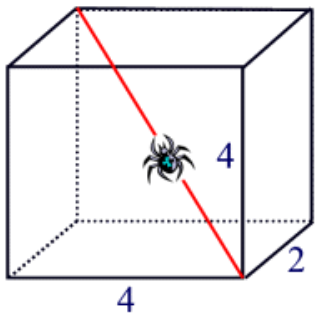


5. An equilateral triangle is plotted on a coordinate plane. Two of the vertices are (0,0) and (8,0). Which of the coordinates shown could be the vertex of the third side?

6. Joe Bean regularly takes a short-cut across Mr. Wilson's lawn instead of walking on the sidewalk on his way home from school. How much distance is saved by Joe cutting across the lawn?
   - 5 ft
   - 10 ft
   - 25 ft
   - 35 ft



7. A spider has taken up residence in a small cardboard box which measures 2 inches by 4 inches by 4 inches. What is the length, in inches, of a straight spider web that will carry the spider from the lower right front corner of the box to the upper left back corner of the box?



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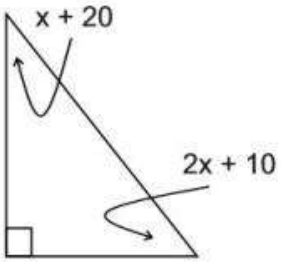
8. The diagram at the right shows a right triangle with representations for two angles. What is the value of x?

- [1] 15
- [2] 20
- [3] 24
- [4] 30



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9. A frisbee lands on the top of a 15' concrete wall. To retrieve the frisbee, a ladder must be placed such that the foot of the ladder is 6 feet from the base of the wall and the top of the ladder rests on the top of the wall. What is the shortest length of a ladder that can be used?

[1] 15' [2] 16' [3] 17' [4] 18'

---

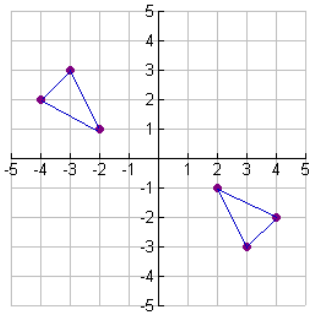
10. At a certain time of the day, the shadow of a 5' boy is 8' long. The shadow of a nearby flagpole at this same time is 28' long. How tall is the flagpole?

[1] 8.5' [2] 16' [3] 17.5' [4] 20'

---

11. Which of the following transformations is illustrated by the graph at the right?

- [1] dilation
- [2] reflection in $y = x$
- [3] translation
- [4] reflection in the origin



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12. Which of the following transformations creates a figure that is similar (but not congruent) to the original figure? I. translation II. rotation III. dilation

[1] I only [2] II only [3] III only [4] II and III

---

13. What is the image of point (4,-2) after a dilation of 3?

[1] (12, -6) [2] (7, 1) [3] (1, -5) [4] (4/3, -2/3)

---

14. Find the length of the line segment whose endpoints are (-3, 4) and (5,4).

Solve applied problems using the attributes of similar triangles.
Solve applied problems using trigonometry.

Content Objective Content Objective Content Objective Content Objective Content Objective Content Objective Content Objective Content Objective Content Objective

Week 7, Lesson 4

1. Warm-up
2. ICA
3. Extra Practice

Language Objectives

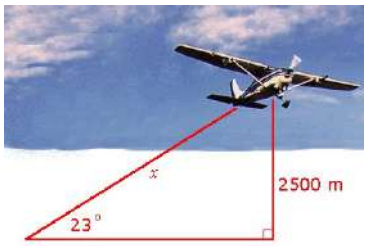
I will discuss with the members of my group how to solve real-world problems involving triangles.

I will demonstrate how to solve triangle problems using similar triangles and trigonometry when appropriate.

Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up

Warm-up: Answer the following questions.

Draw a picture.
Label your sides.
Write all 3 trigonometric ratios.
Solve.



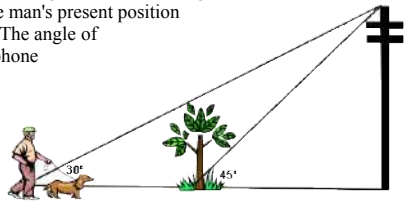
ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity

Answer choices have been provided to give you some confidence in your solutions, not so you can just guess. Do your own work.

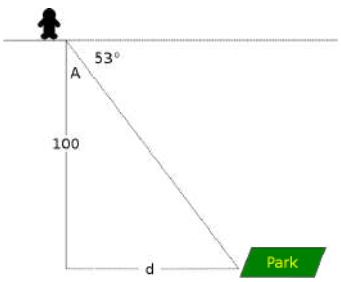
ICA: Show all work. Draw and label the picture.

1. A man is walking his dog on level ground in a straight line with the dog's favorite tree. The angle of elevation from the man's present position to the top of a nearby telephone pole is 30º. The angle of elevation from the tree to the top of the telephone pole is 45º. If the telephone pole is 40 feet tall, how far is the man with the dog from the tree?
Express answer to the *nearest tenth* of a foot.

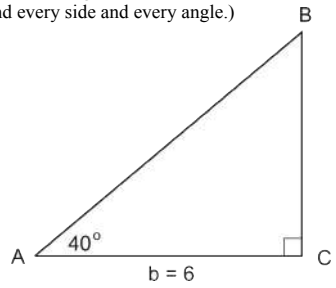
- 1.7 feet
- 29.3 feet
- 42.3 feet



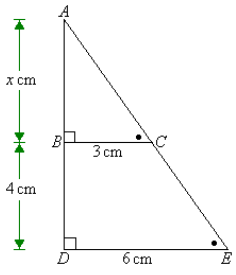
2. Find d.



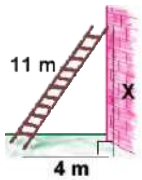
3. Solve the triangle.
(Find every side and every angle.)



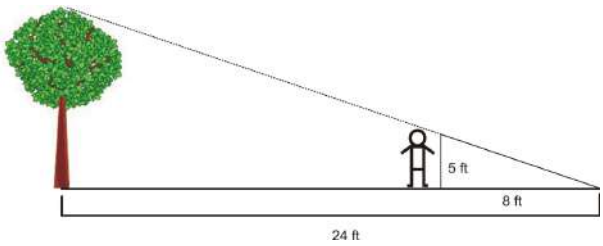
4. Solve for x.



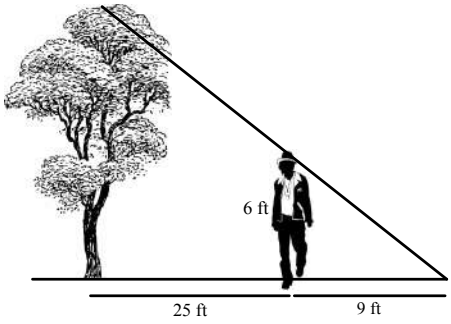
5. Solve for x.



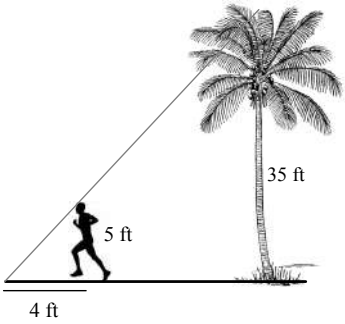
6. Find the height of the tree.



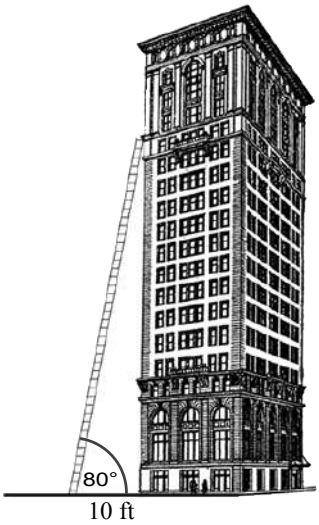
7. Find the height of the tree.



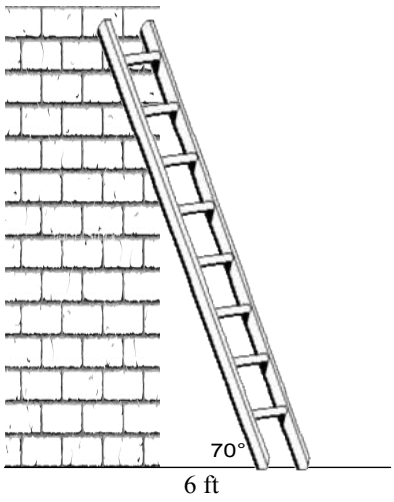
8. Find the length of the shadow of the tree.



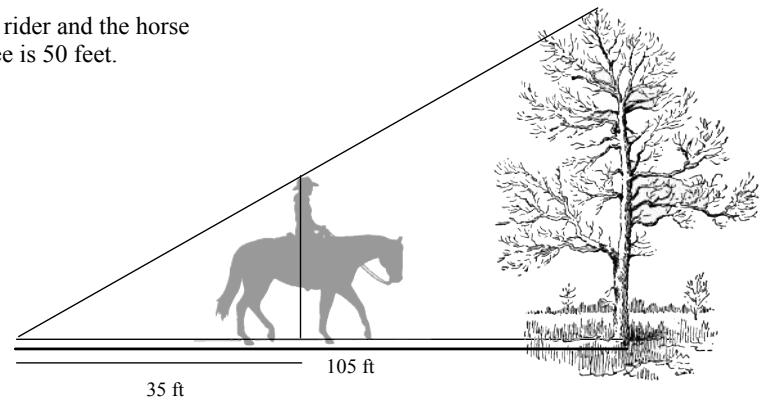
9. Find the height of the ladder



10. Find the height of the ladder



11. Find the height of the rider and the horse if the height of the tree is 50 feet.



12. How tall does the platform need to be for the ladder to be placed at a 50° incline, 10 feet away?