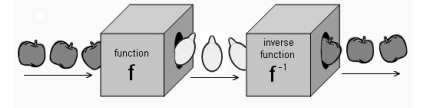


Name \_\_\_\_\_ Per \_\_\_\_\_

LO: I can solve for unknown values by using sine, cosine, and tangent ratios.

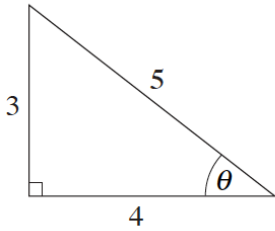


DO NOW On the back of this packet

(1) Using inverse operations (arcsine, arccosine and arctangent) with a calculator to find angle measures

calculator

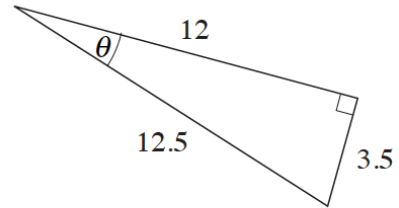
Write the sine, cosine, and tangent equation for each triangle. ( $\theta$  is just another variable like x or y)



$\sin\theta =$  \_\_\_\_\_

$\cos\theta =$  \_\_\_\_\_

$\tan\theta =$  \_\_\_\_\_



$\sin\theta =$  \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

(2)  
calculator

**Using inverse operations (arcsine, arccosine and arctangent) with a calculator to solve problems**

Write and solve an equation for each diagram to find the variable.

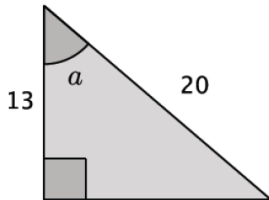
Use the guides below to help you..

(1) Identify what 2 parts you will be using (hyp, opp, adj)

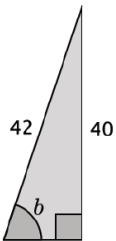
(2) Based on your findings in (1), figure out which trig ratio you need to use (sine, cosine, tangent)

(3) Write an equation and use an inverse operation to solve it.

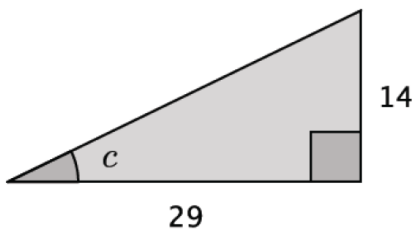
a.



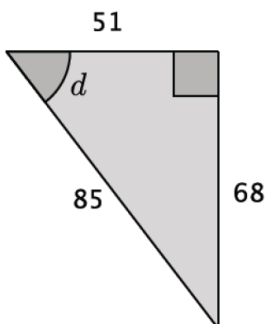
b.



c.



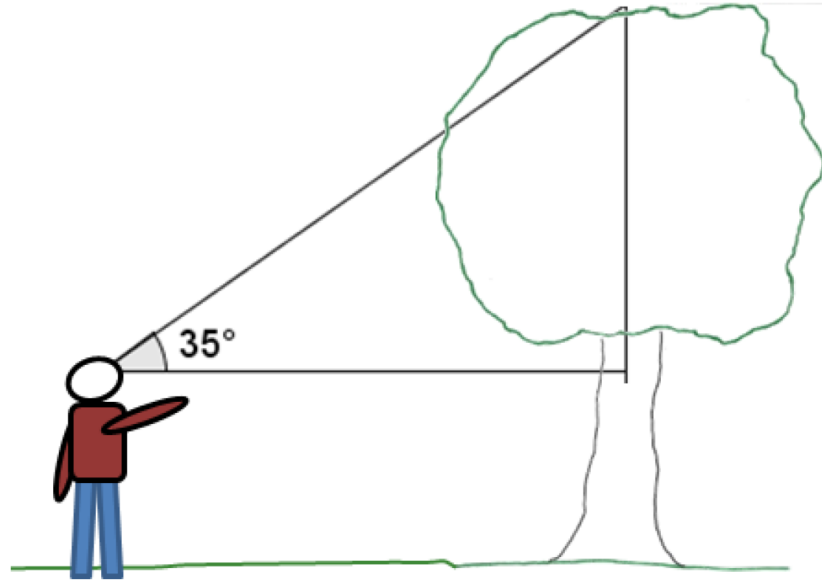
d.



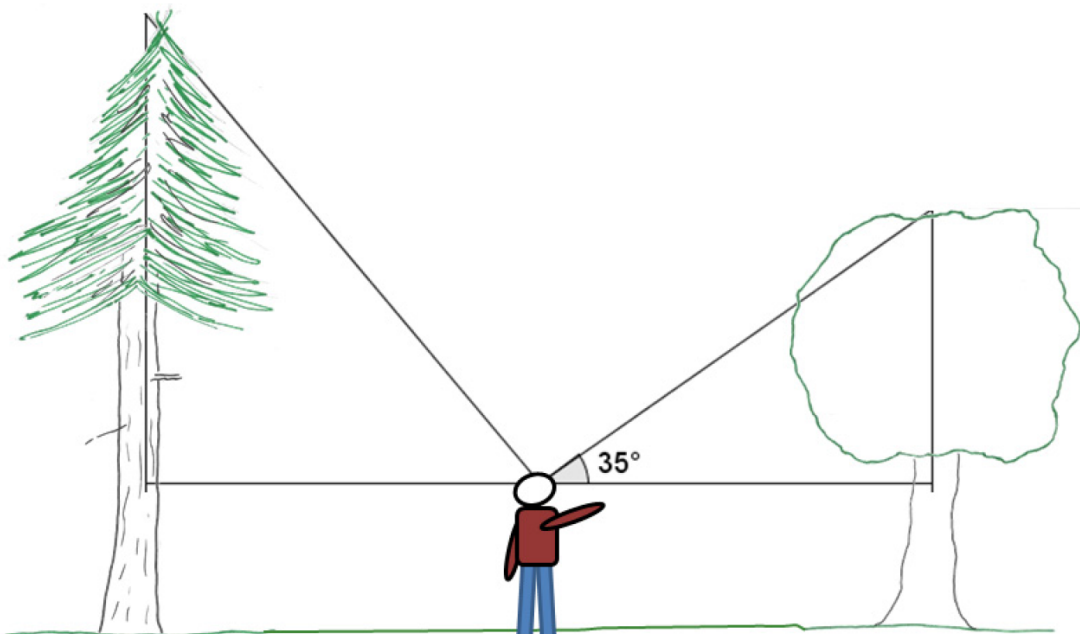
□ (3)  
calculator

### Using inverse operations (arcsine, arccosine and arctangent) with a calculator to solve problems

Dan was walking through a forest when he came upon a sizable tree. Dan estimated he was about 40 meters away from a tree when he measured the angle of elevation between the horizontal and the top of the tree to be 35 degrees. If Dan is about 2 meters tall, about how tall is the tree?



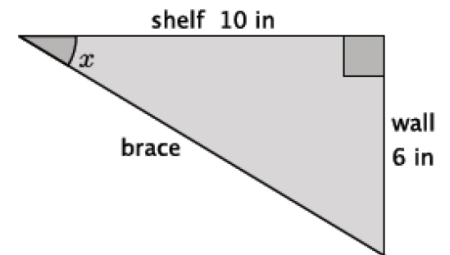
Dan was pretty impressed with this tree ... until he turned around and saw a bigger one, also 40 meters away but in the other direction. "Wow," he said. "I bet that tree is *at least* 50 meters tall!" Then he thought a moment. "Hmm ... if it *is* 50 meters tall, I wonder what angle of elevation I would measure from my eye level to the top of the tree?" What angle will Dan find if the tree is 50 meters tall? Explain your reasoning.



(4)  
calculator

**Using inverse operations (arcsine, arccosine and arctangent) with a calculator to solve problems**

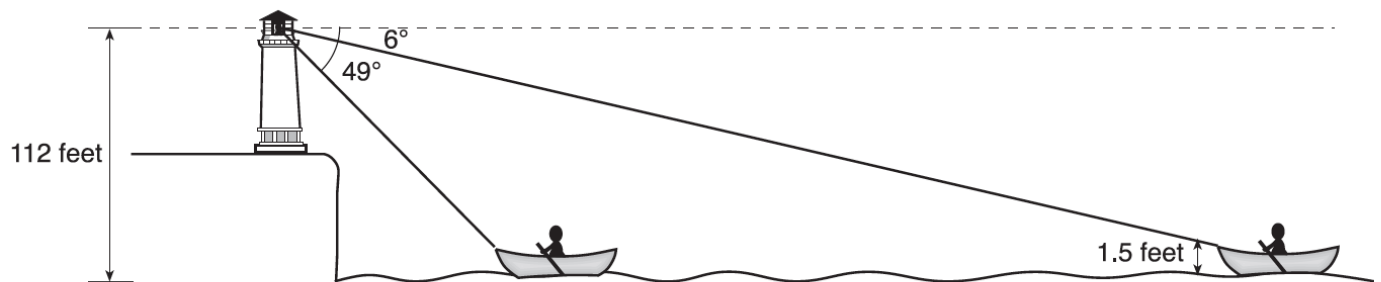
- Shelves are being built in a classroom to hold textbooks and other supplies. The shelves will extend 10 in from the wall. Support braces will need to be installed to secure the shelves. The braces will be attached to the end of the shelf and secured 6 in below the shelf on the wall. What angle measure will the brace and the shelf make?



(5)  
calculator

**Using inverse operations (arcsine, arccosine and arctangent) with a calculator to solve problems**

- As shown below, a canoe is approaching a lighthouse on the coastline of a lake. The front of the canoe is 1.5 feet above the water and an observer in the lighthouse is 112 feet above the water.



( Not drawn to scale )

At 5:00, the observer in the lighthouse measured the angle of depression to the front of the canoe to be  $6^\circ$ . Five minutes later, the observer measured and saw the angle of depression to the front of the canoe had increased by  $49^\circ$ . Determine and state, to the *nearest foot per minute*, the average speed at which the canoe traveled toward the lighthouse.

(6)  
calculator

**Using inverse operations (arcsine, arccosine and arctangent) with a calculator to solve problems**

A group of friends have hiked to the top of the Mile High Mountain. When they look down, they can see their campsite, which they know is approximately 3 miles from the base of the mountain.

a. Sketch a drawing of the situation.

b. What is the angle of depression?

(7)  
calculator

**Using inverse operations (arcsine, arccosine and arctangent) with a calculator to solve problems**

A roller coaster travels 80 ft of track from the loading zone before reaching its peak. The horizontal distance between the loading zone and the base of the peak is 50 ft.

a. Model the situation using a right triangle.

b. At what angle is the roller coaster rising according to the model?

(8)  
calculator

### Using sine, cosine and tangent with a calculator to solve problems

Johanna borrowed some tools from a friend so that she could precisely, but not exactly, measure the corner space in her backyard to plant some vegetables. She wants to build a fence to prevent her dog from digging up the seeds that she plants. Johanna returned the tools to her friend before making the most important measurement: the one that would give the length of the fence!

Johanna decided that she could just use the Pythagorean theorem to find the length of the fence she'd need. Is the Pythagorean theorem applicable in this situation? Explain.

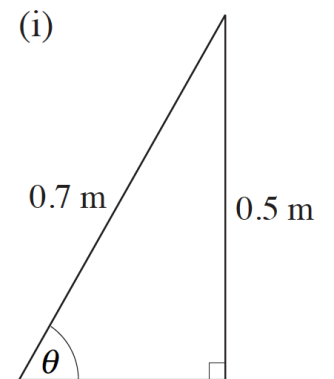
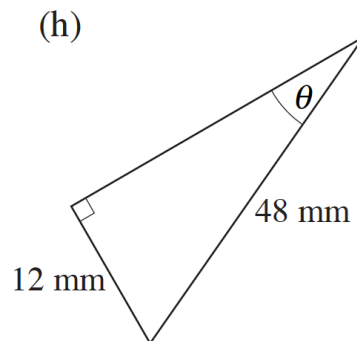
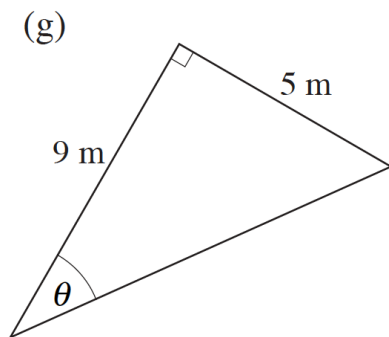
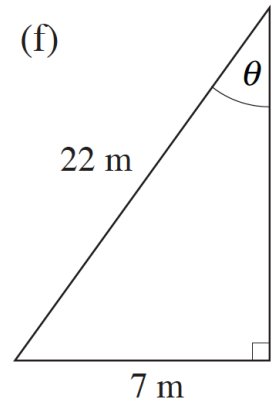
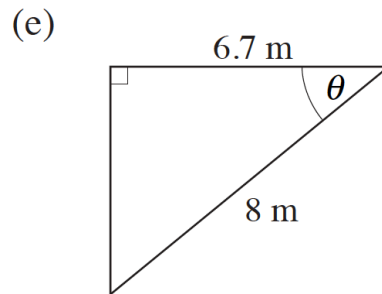
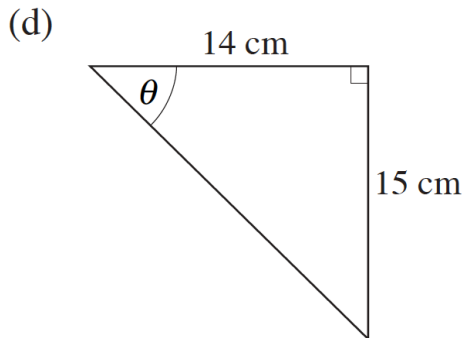


(9) **Exit Ticket**  
calculator

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(10) **Homework**  
calculator

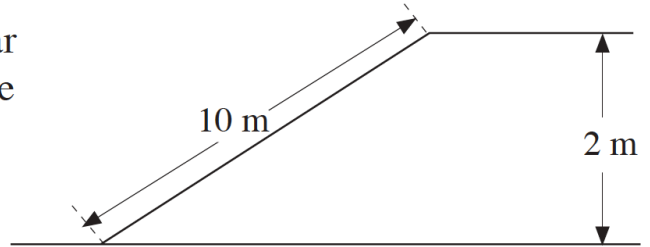
(1) Write an equation and solve for  $x$ .



(10) **Homework**  
calculator

(2)

As cars drive up a ramp at a multi-storey car park, they go up 2 metres. The length of the ramp is 10 metres. Find the angle between the ramp and the horizontal.



(3) A 16 ft ladder leans against a wall. The foot of the ladder is 7 ft from the wall.

a. Find the vertical distance from the ground to the point where the top of the ladder touches the wall.

b. Determine the measure of the angle formed by the ladder and the ground.



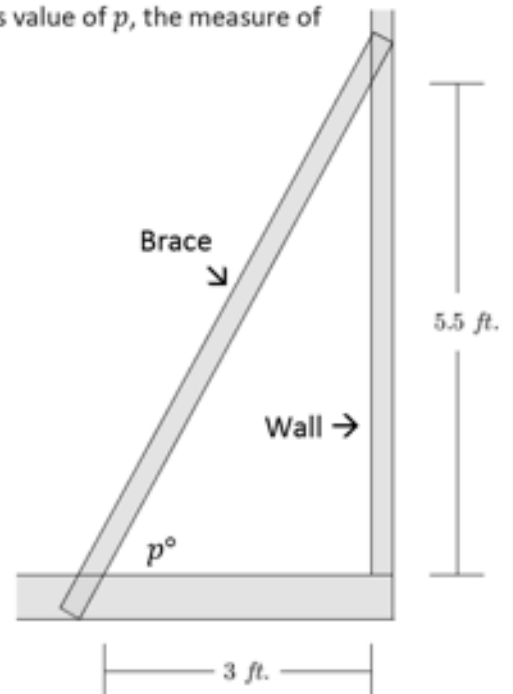
Exit Ticket Name \_\_\_\_\_ Date \_\_\_\_\_ Per \_\_\_\_\_

7.7R

(1) The LO (Learning Outcomes) are written below your name on the front of this packet. Demonstrate your achievement of these outcomes by doing the following:

1. Explain the meaning of the statement " $\arcsin\left(\frac{1}{2}\right) = 30^\circ$ ." Draw a diagram to support your explanation.

2. Gwen has built and raised a wall of her new house. To keep the wall standing upright while she builds the next wall, she supports the wall with a brace, as shown in the diagram below. What is value of  $p$ , the measure of the angle formed by the brace and the wall?



Every operation has an inverse operation that “undoes” what the original operation did. Describe each operation and its inverse below.

In this equation:

What operation is happening to x?

What do we do to get x by itself?

$3x = 24$

\_\_\_\_\_

\_\_\_\_\_

$\frac{x}{4} = 10$

\_\_\_\_\_

\_\_\_\_\_

$x + 12 = 32$

\_\_\_\_\_

\_\_\_\_\_

$x - 1 = 15$

\_\_\_\_\_ subtract 1

\_\_\_\_\_ add 1

$x^2 = 25$

\_\_\_\_\_

\_\_\_\_\_

$\sqrt{x} = 7$

\_\_\_\_\_

\_\_\_\_\_

$\sin x = \frac{4}{7}$

\_\_\_\_\_

\_\_\_\_\_

$\cos x = \frac{2}{3}$

\_\_\_\_\_

\_\_\_\_\_

$\tan x = \frac{10}{3}$

\_\_\_\_\_

\_\_\_\_\_



## Inverse operations

Operation	+	-	X	÷	$\square^2$	$\sqrt{\quad}$	sin	cos	tan
Inverse									