

Name: \_\_\_\_\_ Hour: \_\_\_\_\_ Date: \_\_\_\_\_

## NOTES: Section 13.4 – Evaluate Inverse Trigonometric Functions

Goals: #1 - I can evaluate inverse trig functions.

#2 - I can solve for an angle when given its trig ratio and what quadrant it lies in.

#3 - I can find the measure of an angle when given two sides of a right triangle.

*Homework: Lesson 13.4 Worksheet*



**Exploration #1:** Work with a partner and answer the following questions.

1. Could you find an angle,  $\theta$  whose  $\sin \theta = \frac{1}{2}$ ?

a. Is there another possible angle?

2. Could you find an angle,  $\theta$  whose  $\cos \theta = -\frac{\sqrt{2}}{2}$ ?

a. Is there another possible angle?

3. Could you find an angle,  $\theta$  whose  $\tan \theta = 0$ ?

a. Is there another possible angle?

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**Notes:**

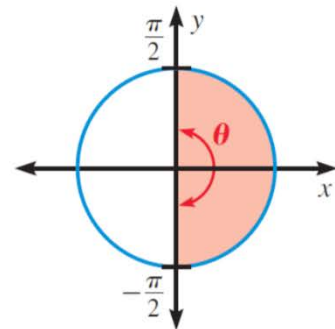
Finding an \_\_\_\_\_ that corresponds to a given value, is called evaluating \_\_\_\_\_ trigonometric functions.

To obtain a unique angle  $\theta$ , we must restrict the \_\_\_\_\_ of the trig function.

- \_\_\_\_\_:

If  $-1 \leq a \leq 1$ , then the **inverse sine** of  $a$  is an angle  $\theta$ , written  $\theta = \sin^{-1} a$ , where:

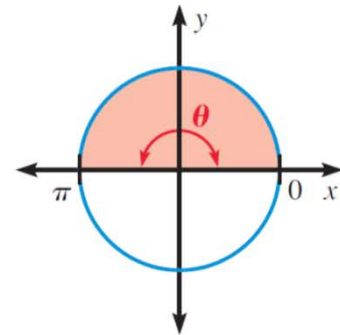
- (1)  $\sin \theta = a$
- (2)



- \_\_\_\_\_:

If  $-1 \leq a \leq 1$ , then the **inverse cosine** of  $a$  is an angle  $\theta$ , written  $\theta = \cos^{-1} a$ , where:

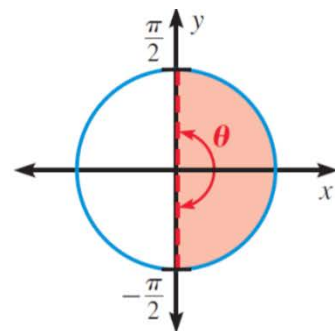
- (1)  $\cos \theta = a$
- (2)



- \_\_\_\_\_:

If  $a$  is any real number, then the **inverse tangent** of  $a$  is an angle  $\theta$ , written  $\theta = \tan^{-1} a$ , where:

- (1)  $\tan \theta = a$
- (2)



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**Example #1:** Evaluate the expression in both radians and degrees.

1.  $\cos^{-1} \frac{\sqrt{3}}{2}$

2.  $\sin^{-1} 2$

3.  $\tan^{-1}(-\sqrt{3})$

**Example #2:** Solve the equation  $\sin \theta = -\frac{5}{8}$  where  $180^\circ < \theta < 270^\circ$ .

**You practice:**

1. Evaluate the expression in both radians and degrees.

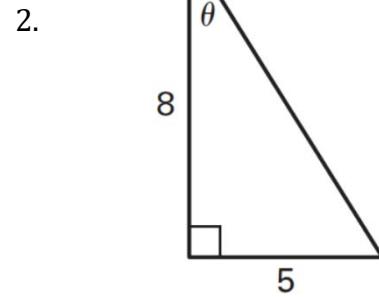
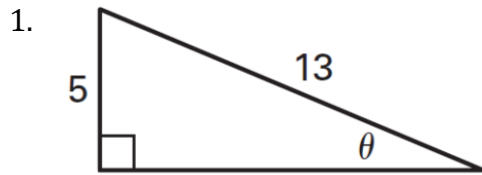
a.  $\cos^{-1} \frac{1}{2}$

b.  $\tan^{-1}(-1)$

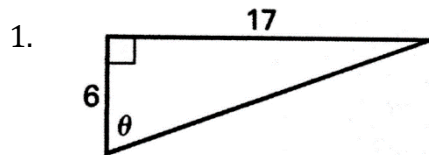
2. Solve the equation  $\tan \theta = 4.7$  where  $180^\circ < \theta < 270^\circ$ .

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**Example #3:** Find the measure of the angle  $\theta$ .



**You practice:** Find the measure of the angle  $\theta$ .



**Example #4:** A monster truck drives off a ramp in order to jump onto a row of cars. The ramp has a height of 8 feet and a horizontal length of 20 feet. What is the angle  $\theta$  of the ramp?