Chapter 4 Trigonometric Functions

Course Number

Instructor

Date

Section 4.1 Radian and Degree Measure

Objective: In this lesson you learned how to describe an angle and to convert between degree and radian measure.

Important Vocabulary Define each term or concept.

Trigonometry

Central angle of a circle

Complementary angles

Supplementary angles

Degree

I. Angles (Page 258)

What you should learn
How to describe angles

An **angle** is determined by . . .

The **initial side** of an angle is . . .

The **terminal side** of an angle is . . .

The **vertex** of an angle is . . .

An angle is in **standard position** when . . .

A **positive angle** is generated by a ________________________ rotation; whereas a **negative angle** is generated by a ________________________ rotation.

If two angles are **coterminal,** then they have . . .

II. Radian Measure (Pages 259–261)

The measure of an angle is determined by . . .

> ***What you should learn***
> How to use radian measure

One **radian** is the measure of a central angle θ that . . .

Algebraically this means that $\theta = \ldots$

A central angle of one full revolution (counterclockwise) corresponds to an arc length of $s =$ _____________.

The radian measure of an angle of one full revolution is ____________ radians. A half revolution corresponds to an angle of ____________ radians. Similarly $\frac{1}{4}$ revolution corresponds to an angle of ____________ radians, and $\frac{1}{6}$ revolution corresponds to an angle of ____________ radians.

Angles with measures between 0 and $\pi/2$ radians are _______________ angles. Angles with measures between $\pi/2$ and π radians are ________________ angles.

To find an angle that is coterminal to a given angle θ, . . .

Example 1: Find an angle that is coterminal with $\theta = -\pi/8$.

Example 2: Find the supplement of $\theta = \pi/4$.

III. Degree Measure (Pages 261–262)

> ***What you should learn***
> How to use degree measure and convert between degree and radian measure

A full revolution (counterclockwise) around a circle corresponds to _____________ degrees. A half revolution around a circle corresponds to _____________ degrees.

To convert degrees to radians, . . .

To convert radians to degrees, . . .

Example 3: Convert 120° to radians.

Example 4: Convert $9\pi/8$ radians to degrees.

Example 5: Complete the following table of equivalent degree and radian measures for common angles.

θ (degrees)	0°		45°		90°		270°
θ (radians)		$\pi/6$		$\pi/3$		π	

IV. Linear and Angular Speed (Pages 263–264)

> ***What you should learn***
> How to use angles to model and solve real-life problems

For a circle of radius r, a central angle θ intercepts an arc of length s given by ________________, where θ is measured in radians. Note that if $r = 1$, then $s = \theta$, and the radian measure of θ equals ________________________________.

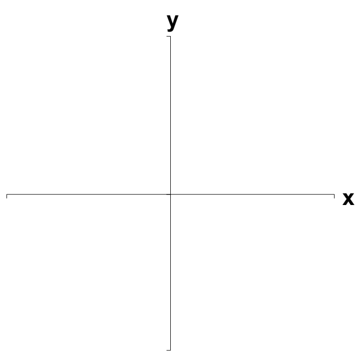
Consider a particle moving at constant speed along a circular arc of radius r. If s is the length of the arc traveled in time t, then the **linear speed** of the particle is

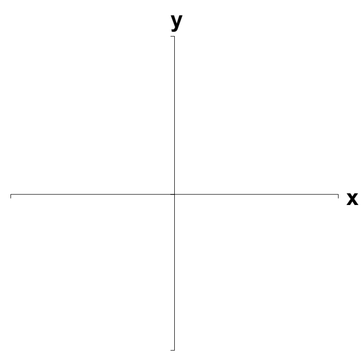
linear speed = __________________________________

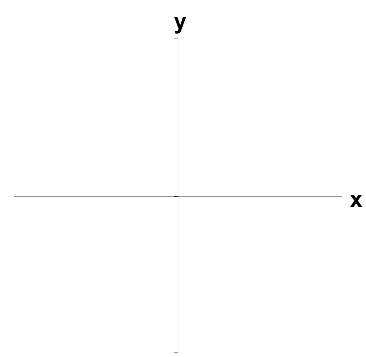
If θ is the angle (in radian measure) corresponding to the arc length s, then the **angular speed** of the particle is

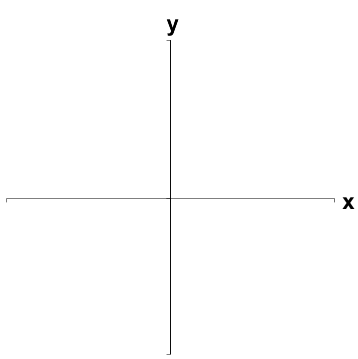
angular speed = ________________________________

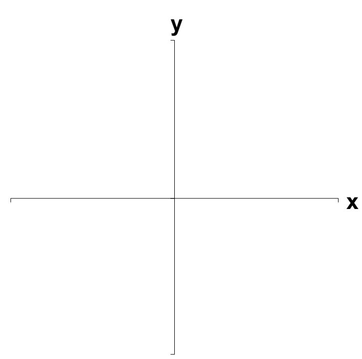
Example 6: A 6-inch-diameter gear makes 2.5 revolutions per second. Find the angular speed of the gear in radians per second.

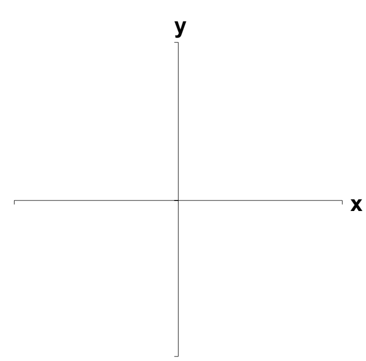












Homework Assignment

Page(s)

Exercises