

Chapter 4 Trigonometry

Section 4.1 Radian and Degree Measure

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

Course Number

Instructor

Date

Important Vocabulary

Define each term or concept.

Trigonometry

Central angle of a circle

Complementary angles

Supplementary angles

Degree

I. Angles (Page 282)

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

What you should learn
How to describe angles

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 283–285)

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 . . .

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

A full revolution around a circle of radius r corresponds to an angle of _____ radians. A half revolution around a circle of radius r 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 285–286)

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

What you should learn
How to use degree
measure

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. Applications of Angles (Pages 287–289)

For a circle of radius r , a central angle θ intercepts an arc 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 = _____

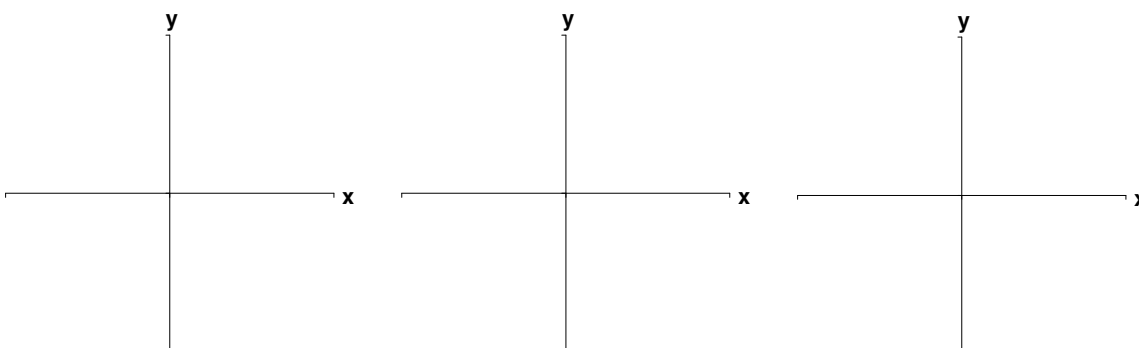
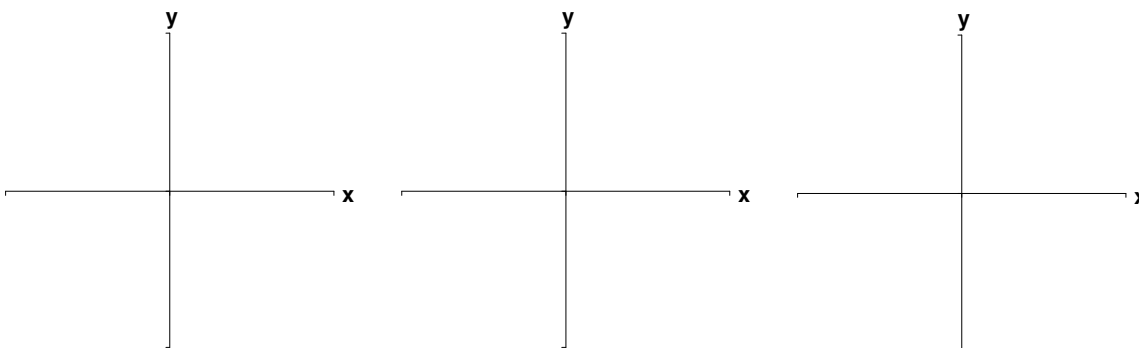
Example 6: A 6-inch-diameter gear makes 2.5 revolutions per second. Find the angular speed of the gear in radians per second.

What you should learn

How to use angles to model and solve real-life problems

A **sector** of a circle is . . .

For a circle of radius r , the area A of a sector of the circle with central angle θ is given by _____, where θ is measured in radians.



Homework Assignment

Page(s)

Exercises