

University of Idaho

**Math 144
Notebook**

**Summer/
Fall 2022**

Healthy Vandals Policies

It is a longstanding tradition that Vandals take care of Vandals, and we all do our best to look out for the Vandal Family. These simple precautions go a long way in reducing the impact of coronavirus on our campuses and in our communities. With everyone engaging in these small actions, we can continue to participate in our vibrant campus culture where we are able to learn, live, and grow. Please bookmark the [University of Idaho Covid-19 webpage](#) and visit it often for the most up-to-date information about the U of I's response to Covid-19.

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MANDATORY ORIENTATION MEETING

All students enrolled in Math 144 for the Summer/Fall 2022 semester must attend an Orientation Meeting. All Orientation Meeting instructions will be emailed to your university email. Please check your university email and follow the directions that were sent to you.

Orientation Meetings will be held on the following dates:

Summer 2022 Session I:

May 16, 2022

May 17, 2022

May 18, 2022

Summer 2022 Session II:

June 27, 2022

June 28, 2022

June 29, 2022

Fall Semester 2022

August 23, 2022

August 24, 2022

August 25, 2022

How to Get Started in MATH 144

How To Get Started...

- 1. Attend the Orientation Meeting. (Check your university email for instructions.) Students who do not attend the orientation meeting will be dropped from the course.

- 2. Opt in to MyLab through Inclusive Access (instructions follow on the next page), **register with your full @vandals.uidaho.edu email address**, and complete the orientation homework.

- 3. Get started on your first homework assignment by reading the eText, filling out every page of the notebook, and completing all homework exercises in MyLab.

Access MyLab or Mastering in Canvas through VitalSource Inclusive Access Materials

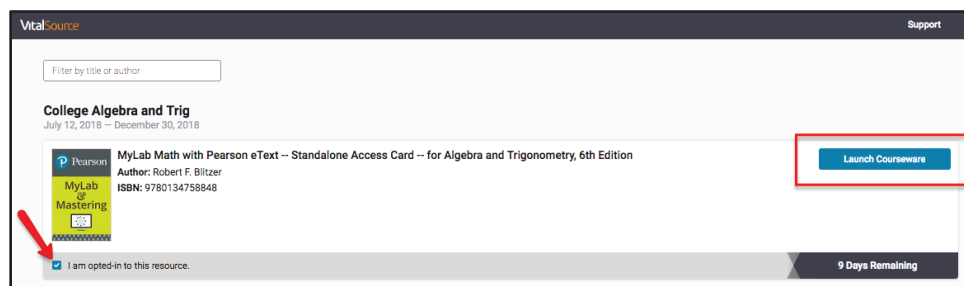
Launch Pearson content

1. Enter your Canvas course and locate the VitalSource Link.

The name and location of the Link may vary based on the set up of the course. In the example below, select the Modules left menu tab. Under the Vitalsource Module, select **Inclusive Access Materials**.



2. Under My Courses, your Pearson materials tied to this course will appear.
3. You are currently **opted-into** Pearson courseware.

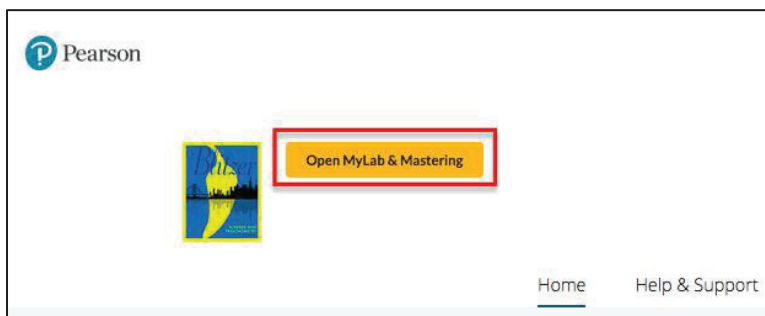


- o Select Launch Courseware.

Access your Pearson course materials

Pearson course materials can be accessed via the VitalSource app.

1. Select **Open MyLab & Mastering** to launch your Pearson course.



Use Help & Support to find downloadable diagnostics about your course. If you contact [Pearson Support](#), you will be asked for this diagnostics file.

Link User Accounts, if needed

2. If prompted, read and select **I Accept** to agree to Pearson's End User License Agreement.
3. Link your Canvas account to either:
 - o An existing Pearson account by entering your Pearson username and password. You **MUST** use your full @vandals.uidaho.edu email address as both your email address and your username. If you are using an existing Pearson account with a different email address or username, contact [Pearson Support](#) to get help in changing them. Keep track of your password by writing it down in a safe place.
 - o A new user Pearson account by selecting the Create button. You **MUST** use your full @vandals.uidaho.edu email address as both your email address and your username. Keep track of your password by writing it down in a safe place.

Register

Sign In with Your Pearson Account

Your account gives you access to your Pearson online courses and products.

Username

Password

[Sign In](#)

[Forgot your username or password?](#)

Create a Pearson Account

If you don't already have an account, create one.

[Create](#)

[Not sure if you have an account?](#)

4. After linking your accounts, select **Go to My Courses**.

You're done!

Check your email for a registration confirmation.

[Print this page as your receipt.](#)

Your Course

Taught by
Course ends Dec 31, 2018

[Go to My Courses](#)

MATH 144
TRIGONOMETRY

Course Syllabus

Summer/Fall 2022

PLEASE NOTE THAT THE RULES AND REGULATIONS FOR THE COURSE THAT ARE OUTLINED IN THIS SYLLABUS ARE SUBJECT TO CHANGE DUE TO ANY INSTITUTIONAL CHANGES THAT MAY OCCUR DUE TO COVID-19.

- 1. GOALS OF THE COURSE:** The primary purpose of Trigonometry is to improve your skills and competency in trigonometry to prepare you for calculus. Another goal is to help you develop your mathematical learning skills so that you will be more confident in future mathematical courses.
- 4. LEARNING OUTCOMES:** After completing Math 144, the student should be able to do the following without the use of a calculator:

Understand the right triangle definitions of the trigonometric functions

Understand the unit circle definitions of the trigonometric functions

Evaluate trigonometric functions of angles belonging to the $\frac{\pi}{3}$, $\frac{\pi}{4}$, and $\frac{\pi}{6}$ families

Sketch the graph of functions of the form $y = A \sin(Bx + C) + D$ and $y = A \cos(Bx + C) + D$

Understand the graph of the tangent function and its properties

Understand the graph of the cosecant and secant functions and their properties

Understand the graphs of the inverse sine function, inverse cosine function, and inverse tangent function

Evaluate expressions involving inverse trigonometric functions

Verify trigonometric identities

Solve trigonometric equations

3. REQUIRED STUDENT MATERIALS/COMPUTER RESOURCES

This is an online course. Every student must have a working computer, webcam, and a fast internet connection.

MATH 144 Summer/Fall 2022 COURSE NOTEBOOK: Fill out every page of the notebook by working through the eText, watching videos, animations, etc. **Filling out the course notebook will give students the best possible chance at success in this course!!**

MyLabs Access: All students must opt in through Inclusive Access (IA) through Canvas. Your instructor will email you directions as to how to access the courseware through Canvas during the Orientation Meeting.

4. GRADE CALCULATION

This course will cover three chapters (Ch 1, Ch 2, and Ch 3). There will be one test after the completion of each chapter (see the Notebook Table of Contents for a list of sections covered) for a total of three tests throughout the semester. Each test is worth 100 points.

There are a total of 15 homework assignments.

Before starting many homework assignments, you will be required to earn a certain score on a practice test. Make sure that you leave yourself enough time to take the practice test before you start each homework assignment. Your total homework percent score will be computed at the end of the semester. Your total homework score is worth 100 points. **This overall Homework score can be used to replace one of your three test scores.**

The tests are cumulative. Each test will cover material from the entire semester leading up to the test. Therefore, Test 3 will cover the entire semester. **For more information about tests, see the section titled TEST PROCEDURES BELOW.**

Calculators are **not allowed** during tests.

Four grades will be used to calculate your final course grade – Homework Average, Test 1, Test 2, and Test 3. The three highest scores will be counted for a total of 300 points.

Your course grade will be based on the total number of points (out of 300) that you have earned as follows:

270 points guarantees an A

240 points guarantees a B

210 points guarantees a C

180 points guarantees a D

5. TEST PROCEDURES

Note: Calculators will NOT BE ALLOWED during any exams in this course.

All tests are password protected and will be proctored. Your instructor will provide detailed proctoring instructions at the Orientation Meeting.

Tests can be taken anytime that you feel you are ready. Tests CANNOT be taken after the deadline. The test deadlines are outlined below:

Summer 2022 Session I:

Test 1	May 27
Test 2	June 10
Test 3	June 24

Summer 2022 Session II:

Test 1	July 8
Test 2	July 22
Test 3	August 5

Fall 2022:

Test 1	September 15
Test 2	October 13
Test 3	November 10

It is strongly recommended that each student schedule tests with the instructor as soon as possible.

NO CALCULATORS of any kind are allowed during tests.

NO NOTES of any kind are allowed during tests, although a sheet of formulas will be provided during Test 3.

NO DEVICES which can transmit or receive data, including but not limited to watches, phones, tablets, iPods, and calculators, may be on your person during the exam. Any such items are expected to be left at home or in a secured place outside of the testing area. Failure to do so will result in a zero on the exam and possibly a failing grade for the course.

Students must earn at least a _____% on the corresponding practice test before the first version of the test will become available.

6. HOMEWORK AND TEST EXTENSIONS

The due dates for the homework and the tests are stated in this notebook. These due dates will not change and there will be **NO EXTENSIONS** except for reasons recognized by the University.

Make up work for assignments missed because of absence will not be allowed unless an arrangement with the instructor is made prior to the absence, or in cases of medical or family emergency, in which case documentation of the emergency will be required.

Documentation must be **provided within two business days** of the assignment's due date, not to exceed the last day for taking Exam 3 based on the term in which you are enrolled. The term-specific schedule(s) is/are listed in notebook.

Email appropriate documentation to your instructor.

If ongoing illness or other circumstances fitting the catalog definition of an excused absence prevent you from bringing documentation for your absence within two business days, then each additional delay must also be documented and the documentation for the delay must be presented with the documentation for the original absence. (See University Catalog under General Requirements and Academic Procedures, section M for details about absences.)

If an extension is granted, the length of the extension will be determined by the number of days listed on the documentation.

7. COMMUNICATIONS AND EMAIL

Announcements about the course, special sessions, changes in schedules or procedures, and so forth, will be sent to your university e-mail account. You are expected to check your University e-mail regularly. **Every student must attend a mandatory orientation session at a time announced via email which will be sent to your university email account.**

All emails must be sent to your instructor using your UNIVERSITY OF IDAHO email account. Emails sent using any other email account will not be read.

All emails must follow standard grammar and punctuation rules. Any email which fails to adhere to these standards will be returned to you for revision. **Emails should also follow basic email etiquette.** Any emails that violate the student code of conduct regarding respect of others will be sent to the Dean of Students as appropriate.

8. THE STUDENT WITH SPECIAL NEEDS

We are committed to accommodate students with special needs. Reasonable accommodations are available for students who have documented temporary or permanent disabilities. All accommodations must be approved through the Center for Disability and Resources located in the Pitman Center, Suite 127 in order to notify your instructor(s) as soon as possible regarding accommodation(s) needed for the course.

(208) 885-6307

email at cdar@uidaho.edu

website at <https://www.uidaho.edu/current-students/cdar>

9. ACADEMIC HONESTY

Students are expected to maintain Academic Honesty in all their work. Collaboration is encouraged on homework assignments. All tests are considered individual work and must be completed without unauthorized assistance of any kind, including the help of other students, tutors, notes, or calculators. All scratch paper from tests is to be collected, scanned, and emailed to your instructor on the day that tests are administered.

The University of Idaho has defined acceptable behavior in the Student Code of Conduct Article II.A-1 – Academic Dishonesty [rev. 7-98, 7-05, 7-14, ed. 7-09]. The following summarizes relevant points related to your math course:

Because academic honesty and integrity are core values at a university, the faculty finds that even one incident of academic dishonesty may merit expulsion.

Cheating tests is a violation of this code.

Plagiarism, falsification of academic records, falsification of records and the acquisition or use of test materials without faculty authorization are considered forms of academic dishonesty and, as such, are violations of this code.

Instructors and students are responsible for maintaining academic standards and integrity in their classes. Consequences for academic dishonesty may be imposed by the course instructor. Such consequences may include but cannot exceed a grade of "F" in the course.

(The full text of the Student Code of Conduct may be found at <https://www.uidaho.edu/student-affairs/dean-of-students/student-conduct>)

10. DUE DATES

Summer 2022**Math 144-01**

Section 1.1 and Section 1.3.....	Tues	May 17
Section 1.4.....	Wed	May 18
Section 1.5.....	Thurs	May 19
Section 1.6.....	Fri	May 20
Section 2.1A.....	Tues	May 24
Test 1	Fri	May 27

Section 2.1B.....	Tues	May 31
Section 2.2.....	Wed	June 1
Section 2.3.....	Thurs	June 2
Section 2.4.....	Fri	June 3
Section 2.5.....	Tues	June 7
Test 2.....	Fri	June 10

Section 3.1.....	Tues	June 14
Section 3.2.....	Wed	June 15
Section 3.3.....	Thurs	June 16
Section 3.5.....	Tues	June 21
Test 3.....	Fri	June 24

Summer 2022**Math 144-02**

Section 1.1 and Section 1.3.....	Tues	June 28
Section 1.4.....	Wed	June 29
Section 1.5.....	Thurs	June 30
Section 1.6.....	Fri	July 1
Section 2.1A.....	Tues	July 5
Test 1	Fri	July 8

Section 2.1B.....	Tues	July 12
Section 2.2.....	Wed	July 13
Section 2.3.....	Thurs	July 14
Section 2.4.....	Fri	July 15
Section 2.5.....	Tues	July 19
Test 2.....	Fri	July 22

Section 3.1.....	Tues	July 26
Section 3.2.....	Wed	July 27
Section 3.3.....	Thurs	July 28
Section 3.5.....	Tues	Aug 2
Test 3.....	Fri	Aug 5

The due dates above will NOT be changed. It is the responsibility of the student to adhere to these deadlines and to take responsibility to make sure that these deadlines are met.

Note: Students may finish this course early by completing all assignments and tests. There is no limit to how fast a student can finish this course.

Fall 2022

Section 1.1 and Section 1.3.....	Thurs	Aug 25
Section 1.4 and Section 1.5.....	Thurs	Sep 1
Section 1.6 and Section 2.1A.....	Thurs	Sep 8
Test 1 A.....	Tues	Sep 13
Test 1 B.....	Wed	Sep 14
Test 1 C.....	Thurs	Sep 15

Section 2.1B and Section 2.2.....	Thurs	Sep 22
Section 2.3 and Section 2.4.....	Thurs	Sep 29
Section 2.5.....	Thurs	Oct 6
Test 2 A.....	Tues	Oct 11
Test 2 B.....	Wed	Oct 12
Test 2 C.....	Thurs	Oct 13

Section 3.1 and Section 3.2.....	Thurs	Oct 20
Section 3.3.....	Thurs	Oct 27
Section 3.5.....	Thurs	Nov 3
Test 3 A.....	Tues	Nov 8
Test 3 B.....	Wed	Nov 9
Test 3 C.....	Thurs	Nov 10

The due dates above will NOT be changed. It is the responsibility of the student to adhere to these deadlines and to take responsibility to make sure that these deadlines are met.

Note: Students may finish this course early by completing all assignments and tests. There is no limit to how fast a student can finish this course.

Math 144 Grade Summary

Enter your scores in the charts below, as percentages. Remember that you may only take one test in a day. See the Syllabus for the requirements.

Homework (HW)

<i>Homework</i>	<i>Possible</i>	<i>Earned</i>
Section 1.1	100	
Section 1.3	100	
Section 1.4	100	
Section 1.5	100	
Section 1.6	100	
Section 2.1A	100	
Section 2.1B	100	
Section 2.2	100	
Section 2.3	100	
Section 2.4	100	
Section 2.5	100	
Section 3.1	100	
Section 3.2	100	
Section 3.3	100	
Section 3.5	100	
Total	1500	

Test Scores

<i>Test</i>	<i>Score</i>
Test 1	
Test 2	
Test 3	

Divide the HW total by 15 and write the result here: _____ Put this result in the table below:

Grading Scale

(Select the highest three of the HW average, Test 1, Test2, and Test 3.)

- A: 270 - 300 pts
- B: 240 - 269 pts
- C: 210 - 239 pts
- D: 180 - 209 pts
- F: Below 180 pts

TOTALS	<i>Possible</i>	<i>Earned</i>
HW (average of all 15)	100	
Test 1	100	
Test 2	100	
Test 3	100	
Sum of the top 3 scores above	300	



Math 144 Grade Summary Example

This person earned an “A” for the course without taking Test 3, and they missed one homework assignment. The scores were rounded to the nearest percent for this example.

Homework (HW)

<i>Homework</i>	<i>Possible</i>	<i>Earned</i>
Section 1.1	100	100
Section 1.3	100	100
Section 1.4	100	95
Section 1.5	100	100
Section 1.6	100	100
Section 2.1A	100	0
Section 2.1B	100	100
Section 2.2	100	99
Section 2.3	100	100
Section 2.4	100	100
Section 2.5	100	95
Section 3.1	100	93
Section 3.2	100	100
Section 3.3	100	95
Section 3.5	100	93
Total	1500	1370

Test Scores

<i>Test</i>	<i>Score</i>
Test 1	95
Test 2	85
Test 3	--

Divide the HW total by 15 (this example has 1370/15) and write the result here: 91 Put this result in the table below:

Grading Scale

(Select the highest three of the HW average, Test 1, Test 2, and Test 3.)

- A: 270 - 300 pts
- B: 240 - 269 pts
- C: 210 - 239 pts
- D: 180 - 209 pts
- F: Below 180 pts

TOTALS	<i>Possible</i>	<i>Earned</i>
HW (average of all 15)	100	91
Test 1	100	95
Test 2	100	85
Test 3	100	0
Sum of the top 3 scores above	300	271



Section 1.1

This lesson will cover Section 1.1 in your e-Text. Work through each of the following tasks, carefully filling out the following pages.

Section 1.1 An Introduction to Angles: Degree and Radian Measure

- Work through TTK #1 then do problem #1
- Work through Objective 1 then do problems #2-3
- Work through Objective 2 then do problems #4-5
- Work through Objective 3 then do problems #6-9
- Work through Objective 4 then do problems #10-14
- Work through Objective 5 then do problems #15-16

Section 1.1 an Introduction to Angles: Degree and Radian Measure

1.1 Things To Know

1. Sketching the Graph of a Circle

Can you sketch the graph of a circle? Try working through a “You Try It” problem or watch the video.

NOW WORK SECTION 1.1 HW EXERCISE #1

Section 1.1 Introduction

What is the definition of a **vertex**?

What is the definition of the **initial side**?

What is the definition of the **terminal side**?

Sketch an angle with positive measure, labeling the vertex, initial side, and terminal side. Do the same for an angle with negative measure.

What does it mean for an angle to be in **standard position**?

Sketch an angle in standard position having positive measure.

Sketch an angle in standard position having negative measure.

Section 1.1 Objective 1 Understanding Degree Measure

In the **degree measure** system, what is the symbol used to indicate a degree? How many degrees are in a one complete counterclockwise rotation?

Sketch three coordinate planes, illustrating angles of 360, 90, and -45 degrees respectively. (See Figures 3, 4, and 5.)

What is the definition of an **acute angle**?

What is the definition of an **obtuse angle**?

What is the definition of a **quadrantal angle**?

What is the term for an angle of exactly 90 degrees?

What is the term for an angle of exactly 180 degrees?

What does it mean for angles to be **coterminal**?

Sketch the two coordinate planes illustrating common positive and negative angles as seen in Figure 6.

Work through the video accompanying Example 1 showing all work below.

Draw each angle in standard position and state the quadrant in which the terminal side of the angle lies or the axis on which the terminal side of the angle lies.

1. $\theta = 60^\circ$ b. $\alpha = -270^\circ$ c. $\beta = 420^\circ$

NOW WORK SECTION 1.1 HW EXERCISES #2-3

Section 1.1 Objective 2 Finding Coterminal Angles Using Degree Measure

What is the definition of **Coterminal Angles**?

Starting with a given angle, how can you obtain coterminal angles? (See the **coterminal angle** definition box.)

What notation is used to denote the angle of least nonnegative measure that is coterminal with θ ?

Work through the video with Example 2 and show all work below.

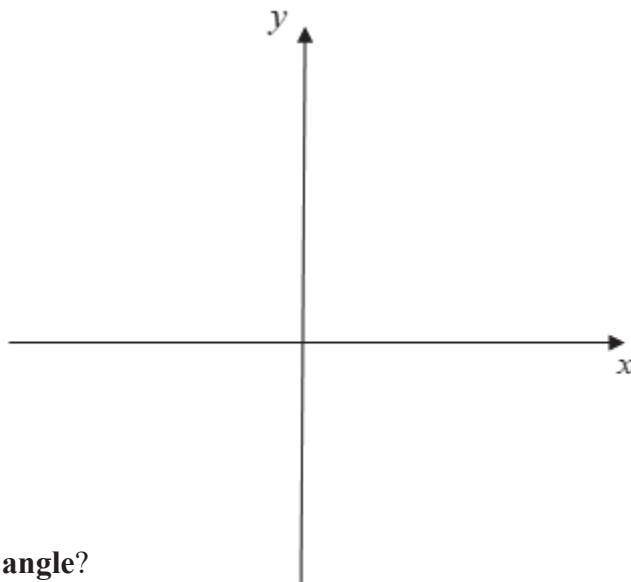
Find the angle of least nonnegative measure, θ_C , that is coterminal with $\theta = -697^\circ$.

NOW WORK SECTION 1.1 HW EXERCISES #4-5

Section 1.1 Objective 3 Understanding Radian Measure

Carefully work through the **animation** seen next to Objective 3 on page 1.1-13 and answer the questions below:

Draw a circle centered at the origin having a radius of r units. What is the equation of the circle?



What is the definition of a **central angle**?

What is the definition of an **intercepted arc**? What variable is typically used to represent it?

On the graph of your circle, above, draw a central angle so that the intercepted arc is the same length as the radius of your circle.

What is the measure of this central angle called?

What is the definition of a **radian**?

Approximately how many radians are there in a circle?

Carefully work through the **animation** seen near the bottom of page 1.1-13 and answer the questions below:

What is the formula for the circumference of a circle of radius r units?

(Fill in the blank) A central angle of 360° intercepts an arc length of _____.

Complete the proportion below as seen in the animation.

$$\frac{360^\circ}{\boxed{}} = \frac{\boxed{}}{r}$$

Fill in the box: $360^\circ = \boxed{}$ radians.

Fill in the box: $180^\circ = \boxed{}$ radians.

Sketch three coordinate planes, illustrating angles of 2π , $\frac{\pi}{2}$, and $\frac{-\pi}{4}$ radians respectively.

(See Figures 10, 11, and 12.)

Sketch two coordinate planes illustrating common positive and negative angles in radians as seen in Figure 13.

Work through the interactive video accompanying Example 3 showing all work below.

Draw each angle in standard position and state the quadrant in which the terminal side of the angle lies or the axis on which the terminal side of the angle lies.

1. $\theta = \frac{\pi}{3}$

b. $\alpha = -\frac{3\pi}{2}$

c. $\beta = \frac{7\pi}{3}$

NOW WORK SECTION 1.1 HW EXERCISES #6-9

Section 1.1 Objective 4 Converting between Degree Measure and Radian Measure

To convert **degrees to radians**, multiply by _____.

To convert **radians to degrees**, multiply by _____.

Work through the interactive video with Example 4 and show all work below.

Convert each angle given in degree measure into radians.

1. 45° b. -150° c. 56°

NOW WORK SECTION 1.1 HW EXERCISES #10-12

Work through the interactive video with Example 5 and show all work below.

Convert each angle given in radian measure into degrees. Round to two decimal places if needed.

- a. $\frac{2\pi}{3}$ radians b. $-\frac{11\pi}{6}$ radians c. 3 radians

NOW WORK SECTION 1.1 HW EXERCISES #13-14

Section 1.1 Objective 5 Finding Coterminal Angles Using Radian Measure

For any angle θ and for any nonzero integer k , we can find a coterminal angle using what expression?

Work through Example 6 and show all work below.

Find three angles that are coterminal with $\theta = \frac{\pi}{3}$ using $k = 1$, $k = -1$, and $k = -2$.

Work through the video with Example 7 and show all work below.

Find the angle of least nonnegative measure, θ_c , that is coterminal with $\theta = -\frac{21\pi}{4}$.

NOW WORK SECTION 1.1 HW EXERCISES #15-16

Section 1.3

This Lesson will cover Section 1.3 in your e-Text. Work through each of the following tasks, carefully filling out the following pages.

Section 1.3 Triangles

- Work through Objective 1 then do problems #1-2
- Work through Objective 2 then do problems #3-4
- Work through Objective 3 then do problems #5-8
- Work through Objective 4 then do problems #9-14
- Work through Objective 5 then do problems #15-16

Section 1.3 Triangles

Section 1.3 Objective 1 Classifying Triangles

What does it mean for two angles or sides of a triangle to be **congruent**?

What is an **acute triangle**?

What is an **obtuse triangle**?

What is a **right triangle**?

Sketch and label an acute, obtuse, and right triangle, as seen in Figure 18.

What is a **scalene triangle**?

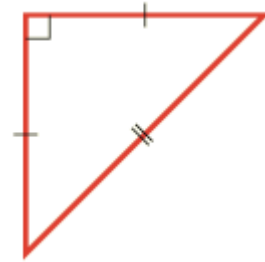
What is an **isosceles triangle**?

What is an **equilateral triangle**?

Sketch a scalene, isosceles, and equilateral triangle, as seen in Figure 19.

Work through Example 1 showing all work below.

Classify the given triangle as acute, obtuse, right, scalene, isosceles, or equilateral. State all that apply.



Watch the animation located on page 1.3-6 of the eText and explain why every isosceles right triangle has two acute angles that have a measure of $\frac{\pi}{4}$ radians.

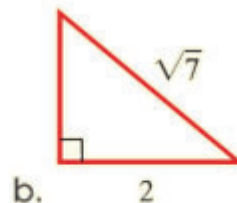
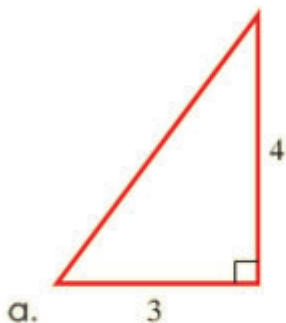
NOW WORK SECTION 1.3 HW EXERCISES #1-2

Section 1.3 Objective 2 Using the Pythagorean Theorem

What is **The Pythagorean Theorem**? (Hint: See the text box on page 1.3-7.)

Work through Example 2 and show all work below.

Use the Pythagorean Theorem to find the length of the missing side of each of the given right triangles.



NOW WORK SECTION 1.3 HW EXERCISES #3-4

Section 1.3 Objective 3 Understanding Similar Triangles

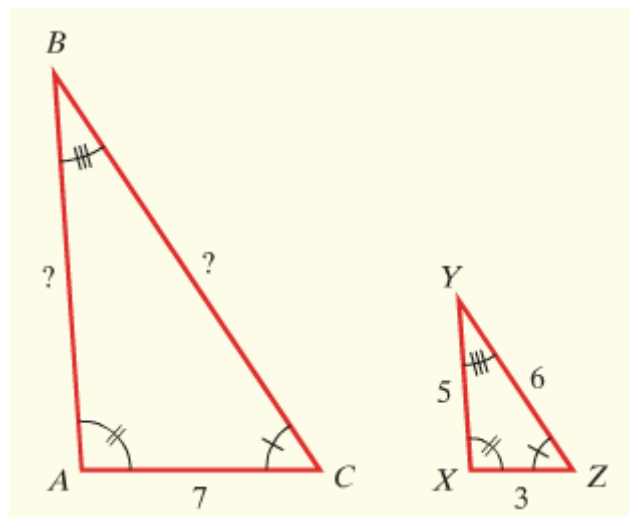
What is the definition of **similar triangles**?

What are the **Properties of Similar Triangles**?

- 1.
- 2.

Work through the video accompanying Example 4 showing all work below.

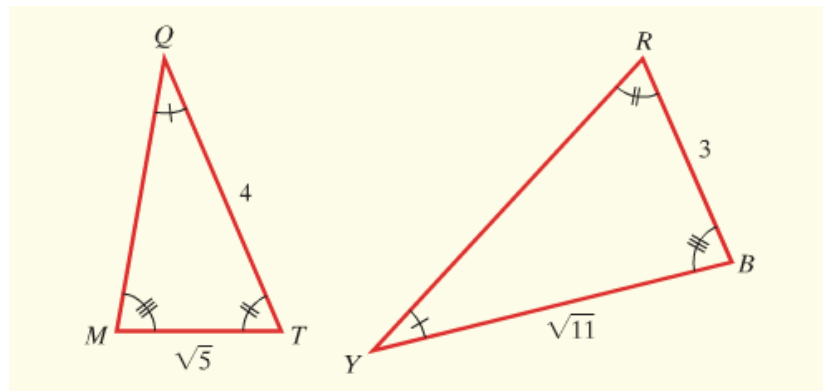
Triangles ABC and XYZ are similar. Find the lengths of the missing sides of triangle ABC.



What is the definition of the **Proportionality Constant of Similar Triangles**?

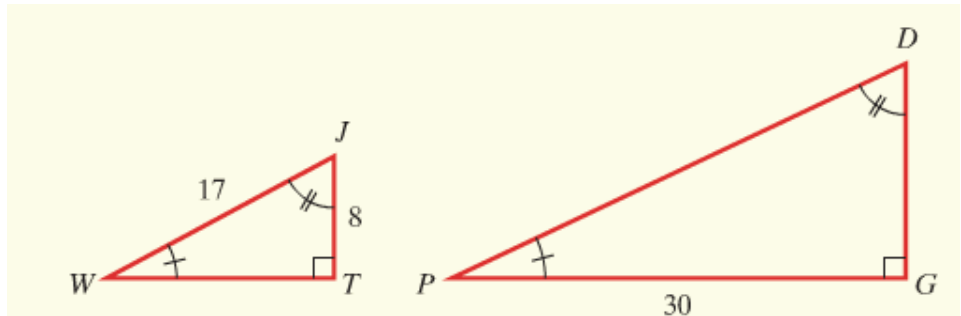
Work through the animation accompanying Example 5 showing all work below.

The triangles below are similar. Find the proportionality constant. Then find the lengths of the missing sides.



Work through the video accompanying Example 6 showing all work below.

The right triangles below are similar. Determine the lengths of the missing sides.



NOW WORK SECTION 1.3 HW EXERCISES #5-8

Section 1.3 Objective 4 Understanding the Special Right Triangles

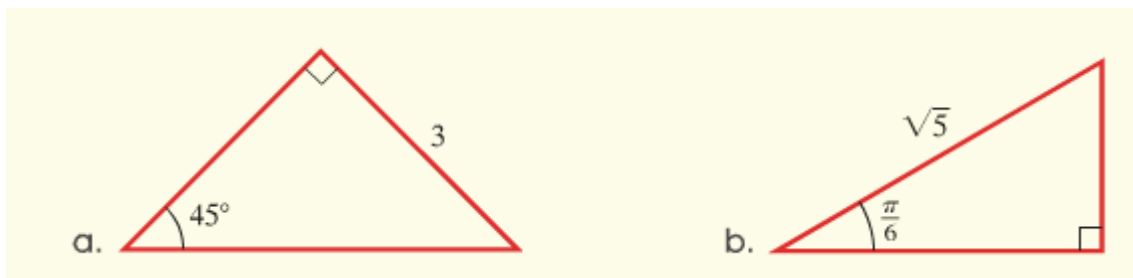
Watch the animation on page 1.3-18 which describes the $\frac{\pi}{4}, \frac{\pi}{4}, \frac{\pi}{2}$ right triangle and take notes on how to establish a relationship between the lengths of the sides.

Sketch and label the $\frac{\pi}{4}, \frac{\pi}{4}, \frac{\pi}{2}$ right triangle as seen in Figure 24.

Watch the animation on page 1.3-19 which describes the $\frac{\pi}{6}, \frac{\pi}{3}, \frac{\pi}{2}$ right triangle and take notes on how to establish a relationship between the lengths of the sides.

Sketch and label the $\frac{\pi}{6}, \frac{\pi}{3}, \frac{\pi}{2}$ right triangle as seen in Figure 28.

Work through the interactive video with Example 7 and show all work below.
Determine the lengths of the missing sides of each right triangle.



NOW WORK SECTION 1.3 HW EXERCISES #9-14

Section 1.3 Objective 5 Using Similar Triangles to Solve Applied Problems

Work through Example 8 and show all work below.

The shadow of a cell tower is 80 feet long. A boy 3 feet 9 inches tall is standing next to the tower. If the boy's shadow is 6 feet long, find the height of the cell tower.

Work through the video with Example 9 and show all work below.

Two people are standing on opposite sides of a small river. One person is located at point Q, a distance of 20 feet from a bridge. The other person is standing on the southeast corner of the bridge at point P. The angle between the bridge and the line of sight from P to Q is 30° . Use this information to determine the length of the bridge and the distance between the two people. Round your answer to two decimal places as needed. **(Note that you will need a calculator for this exercise. Only applications that do not require a calculator will be on your tests!)**

NOW WORK SECTION 1.3 HW EXERCISES #15-16

Section 1.4

This Lesson will cover Section 1.4 in your e-Text. Work through each of the following tasks, carefully filling out the following pages.

Section 1.4 Right Triangle Trigonometry

- Work through TTK #1 then do problem #1
- Work through TTK #2 then do problem #2
- Work through TTK #3 then do problem #3
- Work through Objective 1 then do problems #4-9
- Work through Objective 2 then do problems #10-19
- Work through Objective 3 then do problems #20-25

Section 1.4 Right Triangle Trigonometry

1.4 Things To Know

1. Converting between Degree Measure and Radian Measure (Section 1.1)

Try working through a “You Try It” problem or refer to Section 1.1 or watch the animation.

NOW WORK SECTION 1.4 HW EXERCISE #1

2. Understanding Similar Triangles (Section 1.3)

Try working through a “You Try It” problem or refer to Section 1.3 or watch the video.

NOW WORK SECTION 1.4 HW EXERCISE #2

3. Understanding the Special Right Triangles (Section 1.3)

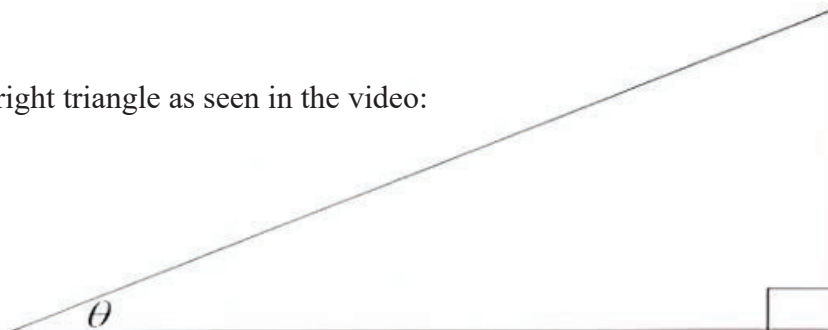
Try working through a “You Try It” problem or refer to Section 1.3 or watch the animation

NOW WORK SECTION 1.4 HW EXERCISE #3

Section 1.4 Objective 1 Understanding the Right Triangle Definitions of the Trigonometric Functions

Watch the video seen at the top of page 1.4-3 and answer the questions below.

- Label the sides of this right triangle as seen in the video:



-Write down the **Right Triangle Definitions of the Trigonometric Functions** by filling in the blanks below:

Given a right triangle with acute angle θ and side lengths of *hyp*, *opp*, and *adj*, the six trigonometric functions of angle θ are defined as follows.

$$\sin \theta = \underline{\hspace{2cm}}$$

$$\csc \theta = \underline{\hspace{2cm}}$$

$$\cos \theta = \underline{\hspace{2cm}}$$

$$\sec \theta = \underline{\hspace{2cm}}$$

$$\tan \theta = \underline{\hspace{2cm}}$$

$$\cot \theta = \underline{\hspace{2cm}}$$

What silly phrase can help you to memorize the ratios for $\sin \theta$, $\cos \theta$, and $\tan \theta$?

Work through the interactive video with Example 1 showing all work below.

Given the right triangle evaluate the six trigonometric functions of the acute angle θ .



NOW WORK SECTION 1.4 HW EXERCISES #4-6

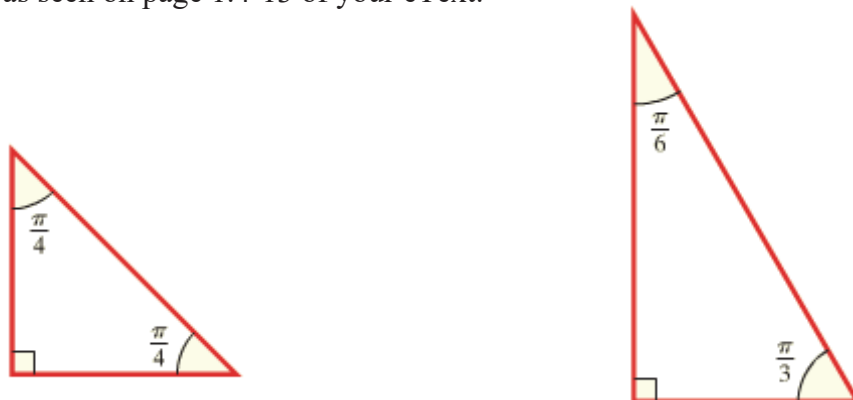
Work through the video with Example 2 showing all work below.

If θ is an acute angle of a right triangle and if $\sin \theta = \frac{3}{4}$, then find the values of the remaining five trigonometric functions for angle θ .

NOW WORK SECTION 1.4 HW EXERCISES #7-9

Section 1.4 Objective 2 Using the Special Right Triangles

Given the two special right triangles shown below, write down the side lengths as seen in Figure 32 on page 1.4-13. You may want to review these special right triangles by working through the animation as seen on page 1.4-13 of your eText.



Copy down the trigonometric functions for acute angles $\frac{\pi}{6}$, $\frac{\pi}{4}$, $\frac{\pi}{3}$ as seen in Table 1.

Table 1

θ	$\frac{\pi}{6}$ (30°)	$\frac{\pi}{4}$ (45°)	$\frac{\pi}{3}$ (60°)
$\sin \theta$	<input type="text"/>	<input type="text"/>	<input type="text"/>
$\cos \theta$	<input type="text"/>	<input type="text"/>	<input type="text"/>
$\tan \theta$	<input type="text"/>	<input type="text"/>	<input type="text"/>

Work through the video with Example 3 and show all work below.

Determine the value of $\csc \frac{\pi}{6} + \cot \frac{\pi}{4}$.

NOW WORK SECTION 1.4 HW EXERCISES #10-13

Work through Example 4 and show all work below.

Determine the measure of the acute angle θ for which $\sec \theta = 2$.

NOW WORK SECTION 1.4 HW EXERCISES #14-19

Section 1.4 Objective 3 Understanding the Fundamental Trigonometric Identities

Watch the video shown on page 1.4-18, then write down **The Quotient Identities**.

Watch the video shown on page 1.4-19, then write down **The Reciprocal Identities?**

Work through Example 5 showing all work below.

Given that $\sin \theta = \frac{5}{7}$ and $\cos \theta = \frac{2\sqrt{6}}{7}$, find the values of the remaining four trigonometric functions using identities.

NOW WORK SECTION 1.4 HW EXERCISES #20-21

Watch the video shown on page 1.4-21, then write down **The Pythagorean Identities?**

Work through the interactive video with Example 6 showing all work below.

Use identities to find the exact value of each trigonometric expression.

1. $\tan 37^\circ - \frac{\sin 37^\circ}{\cos 37^\circ}$

b. $\frac{1}{\cos^2 \frac{\pi}{9}} - \frac{1}{\cot^2 \frac{\pi}{9}}$

NOW WORK SECTION 1.4 HW EXERCISES #22-25

Section 1.5

This Lesson will cover Section 1.5 in your e-Text. Work through each of the following tasks, carefully filling out the following pages.

Section 1.5 Trigonometric Functions of General Angles

- Work through Objective 1 then do problems #1-5
- Work through Objective 2 then do problems #6-9
- Work through Objective 3 then do problems #10-14
- Work through Objective 4 then do problems #15-22
- Work through Objective 5 then do problems #23-27
- Work through Objective 6 then do problems #28-40

Section 1.5 Trigonometric Functions of General Angles

Section 1.5 Objective 1 Understanding the Four Families of Special Angles

What is **The Quadrantal Family of Angles**? Watch the video on page 1.5-4 then sketch the angles shown in Figure 35.

What is **The $\frac{\pi}{3}$ Family of Angles?** Watch the video on page 1.5-5 then sketch the angles shown in Figure 36.

What is **The $\frac{\pi}{6}$ Family of Angles?** Watch the video on page 1.5-6 then sketch the angles shown in Figure 37.

What is **The $\frac{\pi}{4}$ Family of Angles?** Watch the video on page 1.5-7 then sketch the angles shown in Figure 38.

NOW WORK SECTION 1.5 HW EXERCISES #1-2

Work through the interactive video with Example 1 showing all work below.

Each of the given angles belongs to one of the four families of special angles. Determine the family of angles for which it belongs, sketch the angle, and then determine the angle of least nonnegative measure, θ_c , coterminal with the given angle.

a. $\theta = \frac{29\pi}{6}$

b. $\theta = \frac{14\pi}{2}$

c. $\theta = -\frac{18\pi}{4}$

d. $\theta = \frac{11\pi}{4}$

e. $\theta = \frac{14\pi}{6}$

f. $\theta = 420^\circ$

g. $\theta = -495^\circ$

NOW WORK SECTION 1.5 HW EXERCISES #3-5

Section 1.5 Objective 2 Understanding the Definitions of the Trigonometric Functions of General Angles

Work through the animation seen on page 1.5-12 and take notes here.

What are **The General Angle Definitions of the Trigonometric Functions?**

Under what conditions will the following trigonometric functions be undefined (if ever)?

$$\tan \theta = \frac{y}{x} \text{ and } \sec \theta = \frac{r}{x} :$$

$$\csc \theta = \frac{r}{y} \text{ and } \cot \theta = \frac{x}{y} :$$

$$\sin \theta = \frac{y}{r} \text{ and } \cos \theta = \frac{x}{r}$$

Work through the video with Example 2 and show all work below.

Suppose that the point $(-4, -6)$ is on the terminal side of an angle θ . Find the six trigonometric functions of θ .

NOW WORK SECTION 1.5 HW EXERCISES #6-9

Work through the interactive video accompanying Example 3 showing all work below.

Without using a calculator, determine the value of the trigonometric function or state that the value is undefined.

a. $\cos(-11\pi)$

b. $\csc(-270^\circ)$

c. $\tan\left(\frac{13\pi}{2}\right)$

d. $\sin(540^\circ)$

e. $\cot\left(-\frac{7\pi}{2}\right)$

NOW WORK SECTION 1.5 HW EXERCISES #10-14

Section 1.5 Objective 4 Understanding the Signs of the Trigonometric Functions

Watch the video as seen on page 1.5-21 and answer the questions below:

The sign of each trigonometric function is determined by the _____ in which the terminal side of the angle lies.

Which trigonometric functions are positive for all angles with a terminal side lying in the following quadrants?

Quadrant I:

Quadrant II:

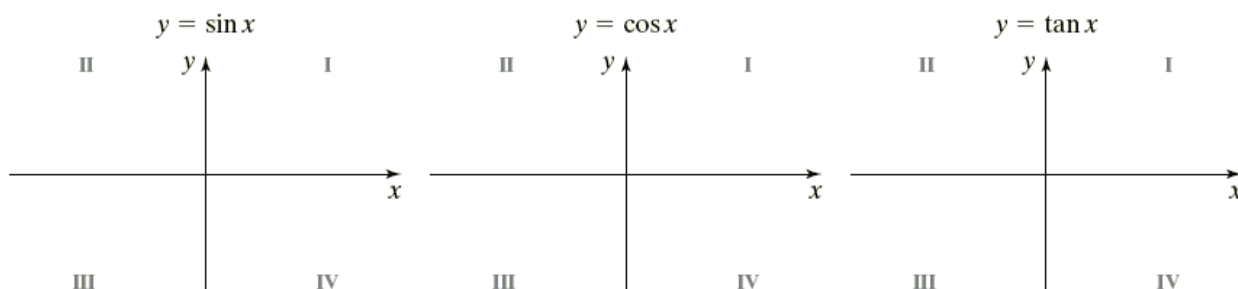
Quadrant III:

Quadrant IV:

What acronym can help us remember the signs of the trigonometric functions for angles whose terminal side lies in one of the four quadrants?

Sketch the diagram shown in Figure 49.

Three grids are shown below. (See Figure 50.) The first grid represents the sign of the values of $y = \sin x$ in each quadrant. The middle grid represents the sign of the values of $y = \cos x$. The third grid represents the sign of the values of $y = \tan x$ in each quadrant. Place a “+” or “-” in each quadrant of each grid to represent the appropriate sign.



NOW WORK SECTION 1.5 HW EXERCISES #15-18

Work through the video with Example 4 and show all work below.

Suppose θ is a positive angle in standard position such that $\sin \theta < 0$ and $\sec \theta > 0$.

- Determine the quadrant in which the terminal side of angle θ lies.

- Find the value of $\tan \theta$ if $\sec \theta = \sqrt{5}$.

NOW WORK SECTION 1.5 HW EXERCISES #19-22

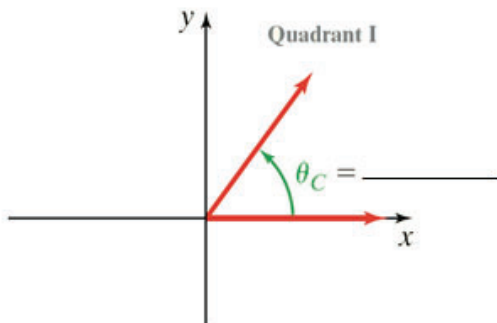
Section 1.5 Objective 5 Determining Reference Angles

What is the definition of the **Reference Angle**?

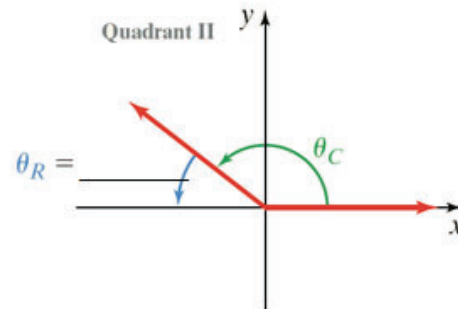
The measure of the _____ θ_R depends on the quadrant in

which the _____ of θ_C lies.

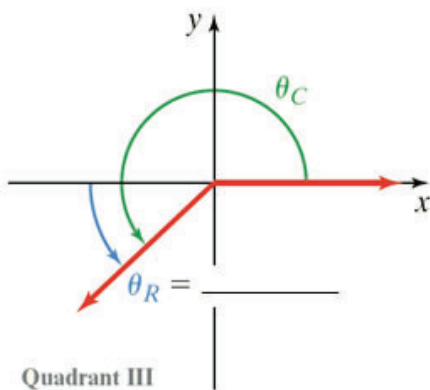
The four cases for reference angles are shown below. Fill in the blanks. (See page 1.5-31 of your eText.)



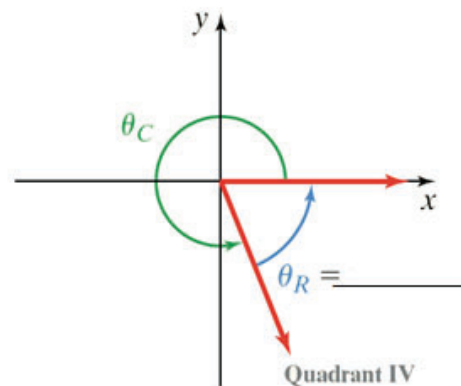
Case 1: If the terminal side of θ_C lies in Quadrant I, then $\theta_R = \underline{\hspace{2cm}}$.



Case 2: If the terminal side of θ_C lies in Quadrant II, then $\theta_R = \underline{\hspace{2cm}}$ (or $\theta_R = \underline{\hspace{2cm}}$).



Case 3: If the terminal side of θ_C lies in Quadrant III, then $\theta_R = \underline{\hspace{2cm}}$ (or $\theta_R = \underline{\hspace{2cm}}$).



Case 4: If the terminal side of θ_C lies in Quadrant IV, then $\theta_R = \underline{\hspace{2cm}}$ (or $\theta_R = \underline{\hspace{2cm}}$).

Work through the interactive video with Example 5 and show all work below.
For each of the given angles, determine the reference angle.

a. $\theta = \frac{5\pi}{3}$

b. $\theta = \frac{11\pi}{4}$

c. $\theta = -\frac{25\pi}{6}$

d. $\theta = \frac{16\pi}{6}$

NOW WORK SECTION 1.5 HW EXERCISES #23-25

Work through the interactive video with Example 6 and show all work below.
For each of the given angles, determine the reference angle.

a. $\theta = \frac{5\pi}{8}$

b. $\theta = \frac{22\pi}{9}$

c. $\theta = -\frac{5\pi}{7}$

NOW WORK SECTION 1.5 HW EXERCISES #26-27

Section 1.5 Objective 6 Evaluating Trigonometric Functions of Angles Belonging to the $\pi/3$, $\pi/6$, or $\pi/4$ Families

Work through the interactive video with Example 8 and show all work below.

Find the values of the six trigonometric functions for $\theta = \frac{7\pi}{4}$.

What are the four **Steps for Evaluating Trigonometric Functions of Angles Belonging to the $\frac{\pi}{3}$, $\frac{\pi}{6}$, or $\frac{\pi}{4}$ Families?**

Step 1:

Step 2:

Step 3:

Step 4:

Work through the interactive video with Example 9 and show all work below.
Find the exact value of each trigonometric expression without using a calculator.

a. $\sin\left(\frac{7\pi}{6}\right)$

b. $\cot\left(-\frac{22\pi}{3}\right)$

c. $\tan\left(\frac{11\pi}{4}\right)$

d. $\cos\left(\frac{11\pi}{3}\right)$

e. $\sec\left(\frac{5\pi}{6}\right)$

f. $\csc\left(-\frac{7\pi}{6}\right)$

NOW WORK SECTION 1.5 HW EXERCISES #28-40

