Learning Works Charter School

Integrated Math 2B
Module 9

Student Name: _____ Teacher Name: _____

As you work through the chapters in your Integrated Math 2 course, you will be encouraged to think and to make conjectures while you persevere through challenging problems and exercises. You will make errors – and that's okay! Learning and understanding occur when you make errors and push through mental roadblocks to comprehend and solve new and challenging problems.

Text: *Integrated Math 2*, Big Ideas, 2016

To ensure you are learning, you must show your work for all exercises.
YOU WILL NOT EARN CREDIT FOR ANSWERS WITHOUT WORK.

Chapter 10: Circles (10.1-10.7)

_____ Maintaining Mathematical Proficiency (page 571): Complete exercises #1-11 **all**

_____ 10.1 Lines and Segments That Intersect Circles: Read the lesson and complete exercises #1, 5-11 **all**, 13, 15, 17, 19, 20, 29, 30, 46

_____ 10.2 Finding Arc Measures: Read the lesson and complete exercises #3, 4, 5, 7, 9, 10, 11, 13, 15, 20, 21, 27, 28, 31, 39, 40, 41

_____ 10.3 Using Chords: Read the lesson and complete exercises #1, 3, 4, 5, 7-11 **all**, 13, 15, 27, 28

_____ 10.4 Inscribed Angles and Polygons: Read the lesson and complete exercises #3-9 **all**, 11, 12, 13, 14, 16, 17, 41, 42, 43, 44

_____ 10.5 Angle Relationships in Circles: Read the lesson and complete exercises #2-7 all, 9, 13, 14, 15, 16, 41, 42

_____ 10.6 Segment Relationships in Circles: Read the lesson and complete exercises #1, 3, 4, 7, 8, 11, 12, 15, 27, 28

_____ 10.7 Circles in the Coordinate Plane: Read the lesson and complete exercises #1, 3, 4, 5, 6, 9, 10, 11, 12, 15, 16, 17, 29, 31, 32, 35, 68-73 **all**

Students must complete the Chapter Review and Project with a teacher or tutor at school.

_____ Chapter Review (pages 628-632): Complete exercises #1-43 **all**

_____ Complete the attached Project **(No project = No credit)**

A teacher or tutor reviewed the Chapter Review and Project with the student.

Date: _____ Signature: _____

Grade

Continued on next page

Integrated Math 2 Project
Module 9: Circles
Textbook Pages 571-634

How a GPS Works in 3D

The following websites may be helpful in answering the questions below. If you use these or others, be sure to cite your sources.
http://www.garmin.com/aboutGPS/
http://electronics.howstuffworks.com/gps.htm
http://www.pbs.org/wgbh/nova/longitude/gpsgame.html

1. What does GPS stand for?

2. How many satellites does the GPS system use? What do you know about those satellites?

3. What is the radius of a GPS satellite's orbit? How long does it take to complete one orbit of the earth?

4. Can you find a picture or diagram that illustrates the GPS satellite system? Sketch it here or attach it to your module.

5. What is a pseudo-random code? What is it used for?

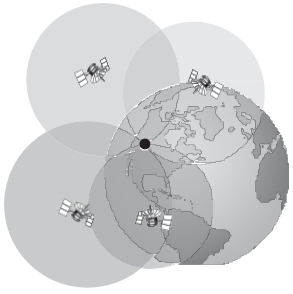
6. Why do you need at least 3 satellites to determine your latitude and longitude?

7. Besides giving position (latitude and longitude), what else can a GPS receiver find/compute?

Finding Locations

Scientists use seismographs to locate the epicenter of an earthquake. They use distance data taken from the instruments to create three circles. The intersection of these circles determines the precise location of the epicenter. This process, which is called trilateration, is also used by the Global Positioning System (GPS) to determine a person's location. How does it work?

The Global Positioning System is a constellation of 29 satellites orbiting Earth at an altitude of about 11,000 miles. Twenty-four of these satellites provide global coverage for GPS receivers and five of the satellites serve as spares.



The orbits of these satellites were designed so that at any time, at any location on Earth, a GPS receiver can see four satellites. Each satellite transmits encoded information indicating its location at a precise time. The receiver uses this information to calculate distances from the satellites. Each distance then becomes the radius of a sphere, and the intersection of the spheres gives the specific location of the receiver.

A similar process using three distances in 2-dimensions can identify locations on a flat map with the intersection of three circles.

1. You are in Idaho. The table shows GPS data from three satellites. Each satellite gives your distance from a central location.

Satellite	Distance (miles)	Central Location
1	about 70	American Falls, ID
2	about 138	Twin Falls, ID
3	about 213	Boise, ID

   a. Graph this information from satellite 1 on the map of Idaho (attached to this packet). Use a compass or piece of string to help you. According to the map, which cities might you be located in?

   b. Graph the information from satellite 2 on the same map using a different color. Which cities are eliminated from the possible locations you listed in part (a)? Which cities might you be located in?

   c. Graph the information from satellite 3 on the same map using a third color. What is your location?

2. You are in Idaho. The table shows GPS data from three satellites. Each satellite gives your distance from a central location to your location.

Satellite	Distance (miles)	Central Location
1	about 138	Challis, ID
2	about 175	Salmon, ID
3	about 288	Coeur d'Alene,

   a. Graph the information from satellite 1 on your second map of Idaho (also attached). Which cities might you be located in?

   b. Graph the information from satellite 2 on the same map using a different color. Which cities are eliminated from the possible locations you listed in part (a)? Which cities might you be located in?

   c. Graph the information from satellite 3 on the map using a third color. What is your location?

3. Choose a location on this map or another one. Create satellite data so that a GPS receiver will find your location.

Miles

0 25 50 75 100 125 150 175 200 225 250 275 300

Miles

0 25 50 75 100 125 150 175 200 225 250 275 300