

Rationale:

The Apprenticeship and Work Place Mathematics program is designed to prepare you for the mathematical understandings and critical-thinking skills required for successful entry into the work force and the majority of trades.

Material Covered:

The Apprenticeship and Workplace Mathematics 12 course is divided into eight units:

- Linear Relations
- Trigonometry
- Probability and Odds
- Statistics
- Limits to Measurement
- Properties of Geometric Figures
- Transformations
- Owning a Small Business

Textbook:

The course uses the text *MathWorks 12*. (ISBN 978-0-9865108-1-6, Pacific Educational Press)

Notebook:

Your notebook should be neatly organized, as this will help you study for tests. Label the unit and topic headings clearly at the top of the page. Answer questions fully, so that the information makes sense and can be used later for studying. Show which textbook and which page number the information comes from so you can look it up again easily.

Grading:

This course works on a mastery system. You must pass the mastery tests in each unit to the 80% level before you can go on. In addition, there are cumulative tests from time to time. These are tests you can only take once, so studying before them is essential to do well. Your final class mark for the course is based 60% on the mastery unit tests and 40% on the cumulative tests.

Goal:

The goal of this unit is to increase your abilities with linear relations.

Objectives:

By the end of this unit you should be able to:

- Recognize both linear and non-linear relations when presented as graphs, tables of values, or equations.
- Create tables of values and graphs.
- Represent linear relations by writing an equation.
- Discuss and represent trends in the data displayed in scatter plots.
- Extrapolate and interpolate trend data by using equations.

What to Do in this Unit:

- This Unit uses Chapter 1 in the textbook.
- Read and follow the example problems at the beginning of each section, then do the practice problems listed for each section in the table below. Be sure to tick off each section as you complete it.
- When solving problems that involve formulae always **Show FSS** (**F**ormula used, **S**ubstitution of knowns, **S**olution for unknown). You will be required to **Show FSS** on tests for full marks.

| Unit 1 | | |
|--------|----------|-----------------------------------|
| ✓ | Chapter | Practice by doing these questions |
| | 1.1 | p.22 #1-8 |
| | 1.2 | p.41 #1-9 |
| | 1.3 | p.56 #1-3 |
| | 1.4 | p.60 #1-8 |
| | Practice | p.70 #1-8 |

- When you are ready ask your teacher for the Unit 1 Test. Remember, you must get 80% to pass, so studying hard is essential to do well.

Goal:

The goal of this unit is to practice using trigonometry in real-life workplace situations, using the sine law and cosine law to find unknown lengths and angles in oblique triangles.

Objectives:

By the end of this unit you should be able to:

- Find an unknown length of an oblique triangle using the sine law.
- Find an unknown angle of an oblique triangle using the sine law.
- Find an unknown length of an oblique triangle using the cosine law.
- Find an unknown angle of an oblique triangle using the cosine law.

What to Do in this Unit:

- This Unit uses Chapter 7 in the textbook.
- Read and follow the example problems at the beginning of each section, then do the practice problems on the pages in the table below. Be sure to tick off each section as you complete it.
- When solving problems that involve formulae always **Show FSS** (**F**ormula used, **S**ubstitution of knowns, **S**olution for unknown). You will be required to **Show FSS** on tests for full marks.

| Unit 2 | | |
|--------|----------|-----------------------------------|
| ✓ | Chapter | Practice by doing these questions |
| | 7.1 | p.254 #1-6 |
| | 7.2 | p. 266 #1-7 |
| | Practice | p.271 #1-7 |

- When you are ready ask your teacher for the Unit 2 Test. Remember, you must get 80% to pass, so studying hard is essential to do well.
- Go over your work from Units 1 and 2 in preparation for Cumulative Test #1. When you are ready to write it, ask your teacher. Remember, this test is one chance only, so do your best.

Goal:

The goal of this unit is to familiarize you with how averages are used in statistics and how to measure other types of values in a data set.

Objectives:

By the end of this unit you should be able to:

- Describe and use different forms for expressing an average.
- Determine what a percentile rank is and how to calculate it.
- Discuss the similarities and differences between averages and percentiles.

What to Do in this Unit:

- This Unit uses Chapter 3 in the textbook.
- Read and follow the example problems at the beginning of each section, then do the practice problems on the pages in the table below. Be sure to tick off each section as you complete it.
- When solving problems that involve formulae always **Show FSS** (**F**ormula used, **S**ubstitution of knowns, **S**olution for unknown). You will be required to **Show FSS** on tests for full marks.

| Unit 3 | | |
|--------|----------|-----------------------------------|
| ✓ | Chapter | Practice by doing these questions |
| | 3.1 | p.118 #1-6 |
| | 3.2 | p.130 #1-6 |
| | 3.3 | p.140 #1-6 |
| | Practice | p.143 #1-5 |

- When you are ready ask your teacher for the Unit 3 Test. Remember, you must get 80% to pass, so studying hard is essential to do well.

Goal:

The goal of this unit is to familiarize you with how probability calculations can help you make predictions.

Objectives:

By the end of this unit you should be able to:

- Express probability as a fraction, decimal, percent, or in a statement.
- Calculate the probability of an event occurring.
- Discuss the difference between odds and probability.
- Analyze and interpret problems using probability.

What to Do in this Unit:

- This Unit uses Chapter 4 in the textbook.
- Read and follow the example problems at the beginning of each section, then do the practice problems on the pages in the table below. Be sure to tick off each section as you complete it.
- When solving problems that involve formulae always **Show FSS** (**F**ormula used, **S**ubstitution of knowns, **S**olution for unknown). You will be required to **Show FSS** on tests for full marks.

| Unit 4 | | |
|--------|----------|-----------------------------------|
| ✓ | Chapter | Practice by doing these questions |
| | 4.1 | p.154 #1-6 |
| | 4.2 | p.162 #1-6 |
| | 4.3 | p.172 #1-6 |
| | Practice | p.175 #1-7 |

- When you are ready ask your teacher for the Unit 4 Test. Remember, you must get 80% to pass, so studying hard is essential to do well.

Goal:

The goal of this unit is to familiarize you with the concepts of accuracy, precision, uncertainty, and tolerance.

Objectives:

By the end of this unit you should be able to:

- Describe the concept of measurement accuracy.
- Describe the concept of measurement precision.
- Discuss the difference between accuracy and precision.
- Calculate the uncertainty of a measurement.
- Describe acceptable tolerances in various workplaces.

What to Do in this Unit:

- This Unit uses Chapter 2 in the textbook.
- Read and follow the example problems at the beginning of each section, then do the practice problems on the pages in the table below. Be sure to tick off each section as you complete it.
- When solving problems that involve formulae always **Show FSS** (**F**ormula used, **S**ubstitution of knowns, **S**olution for unknown). You will be required to **Show FSS** on tests for full marks.

| Unit 5 | | |
|--------|----------|-----------------------------------|
| ✓ | Chapter | Practice by doing these questions |
| | 5.1 | p.88 #1-6 |
| | 5.2 | p.100 #1-6 |
| | Practice | p.104 #1-6 |

- When you are ready, ask your teacher for the Unit 5 Test. Remember, you must get 80% to pass, so studying hard is essential to do well.
- Go over your work from Units 3, 4 and 5 in preparation for Cumulative Test #2. When you are ready to write it, ask your teacher. Remember, this test is one chance only, so do your best.

Goal:

The goal of this unit is to familiarize you with the properties of triangles, quadrilaterals, and regular polygons.

Objectives:

By the end of this unit you should be able to:

- Describe the properties of triangles using side length and angle measures.
- Describe the properties of quadrilaterals using side lengths, angle measures, diagonal lengths, and angles of intersection.
- Describe the properties of regular polygons, including pentagons, hexagons, and octagons.
- Identify uses of these geometric shapes.

What to Do in this Unit:

- This Unit uses Chapter 5 in the textbook.
- Read and follow the example problems at the beginning of each section, then do the practice problems on the pages in the table below. Be sure to tick off each section as you complete it.
- When solving problems that involve formulae always **Show FSS** (**F**ormula used, **S**ubstitution of knowns, **S**olution for unknown). You will be required to **Show FSS** on tests for full marks.

| Unit 6 | | |
|--------|----------|-----------------------------------|
| ✓ | Chapter | Practice by doing these questions |
| | 5.1 | p.187 #1-6 |
| | 5.2 | p.198 #1-5 |
| | 5.3 | p.207 #1-6 |
| | Practice | p.211 #1-6 |

- When you are ready ask your teacher for the Unit 6 Test. Remember, you must get 80% to pass, so studying hard is essential to do well.

Goal:

The goal of this unit is to familiarize you with transformations, including translations, reflections, rotations, and dilations.

Objectives:

By the end of this unit you should be able to:

- Identify and draw translations on two-dimensional shapes.
- Identify translations on three-dimensional objects.
- Draw and analyze two-dimensional shapes that have undergone a series of transformations.
- Describe designs in all four quadrants of a coordinate plane.
- Solve problems involving transformations.

What to Do in this Unit:

- This Unit uses Chapter 6 in the textbook.
- Read and follow the example problems at the beginning of each section, then do the practice problems on the pages in the table below. Be sure to tick off each section as you complete it.
- When solving problems that involve formulae always **Show FSS** (**F**ormula used, **S**ubstitution of knowns, **S**olution for unknown). You will be required to **Show FSS** on tests for full marks.

| Unit 7 | | |
|--------|----------|-----------------------------------|
| ✓ | Chapter | Practice by doing these questions |
| | 6.1 | p.226 #1-6 |
| | 6.2 | p.238 #1-6 |
| | Practice | p.243 #1-6 |

- When you are ready ask your teacher for the Unit 7 Test. Remember, you must get 80% to pass, so studying hard is essential to do well.
- Go over your work from Units 6 and 7 in preparation for Cumulative Test #3. When you are ready to write it, ask your teacher. Remember, this test is one chance only, so do your best.

Goal:

The goal of this unit is to familiarize you with what it is like to start and operate a small business.

Objectives:

By the end of this unit you should be able to:

- Explain how likely a business is to succeed.
- Describe how a business earns and spend money.
- Calculate whether a business makes or loses money.
- Describe how to improve a business's financial performance.
- Explain how a business may acquire a vehicle.

What to Do in this Unit:

- This Unit uses Chapter 8 in the textbook.
- Read and follow the example problems at the beginning of each section, then do the practice problems on the pages in the table below. Be sure to tick off each section as you complete it.
- When solving problems that involve formulae always **Show FSS** (**F**ormula used, **S**ubstitution of knowns, **S**olution for unknown). You will be required to **Show FSS** on tests for full marks.

| Unit 8 | | |
|--------|----------|-----------------------------------|
| ✓ | Chapter | Practice by doing these questions |
| | 8.1 | p.282 #1-6 |
| | 8.2 | p.293 #1-7 |
| | 8.3 | p.304 #1-7 |
| | Practice | p.307 #1-6 |

- When you are ready ask your teacher for the Unit 8 Test. Remember, you must get 80% to pass, so studying hard is essential to do well.

Congratulations! You've finished Mathematics 12 A&W!