

**Objective:** Math II students will construct a portfolio that will assist in their mastery of the curriculum for the course.

**Procedures:** For each Math II topic the following procedures will be followed.

1. Write the portfolio item and number at the top of the page. For example:
  - 1.1. Discuss the meaning of *function*. Include in your discussion the meaning of domain, range, independent variable, and dependent variable.
2. State the definitions and theorems that relate to the topic.
3. Write in words the procedure used for completion of a problem related to the topic. Number the steps used. **Include examples in your entry.** The examples should be worked out entirely and should include graphs and diagrams as necessary.
4. There should only be *one* topic per page.
5. Your portfolio *must* be *hand-written*. **TYPED ENTRIES WILL NOT BE ACCEPTED.**
6. You should include problems that relate to the individual topic.
7. ***Each student is responsible for his/her own work.*** If you work with someone, I expect the procedure to be in each individual student's own words. You may *not* split up the topics and only do a few. This defeats the purpose of the portfolio.
8. Interim portfolio checks will be made at the end of each unit. Portfolios are to be submitted in a three-ring notebook. There should be seven sections in the notebook: one for each unit.
9. The grade you receive for the cumulative portfolio will be a test grade added at the end of each nine weeks. I will the average of each portfolio grade to get the final grade.

## Unit 1: Functions

\_\_\_1.1 Discuss the meaning of *function*. Include in your discussion the meaning of domain, range, independent variable, and dependent variable. Include examples.

\_\_\_1.2 Explain the multiplication, division, and zero laws of exponents. Include examples.

\_\_\_1.3 What is a term? Explain how to simplify a polynomial expression. Include the meaning of degree, constant, and coefficient in your discussion.

\_\_\_1.4 Explain GCF, trinomial factoring of quadratics, and difference of squares.

\_\_\_1.5 Describe the difference between a direct variation and an inverse variation. Include examples. How do you solve these types of equations?

\_\_\_1.6 Show how the degree of a polynomial affects the graph. Include the equation, graph, table of values, and explanation for at least 4 different degree polynomials.

## Unit 2: Quadratics

\_\_\_2.1 What are the key features of quadratics? Examples must include graphs.

\_\_\_2.2 What does it mean to "solve" a quadratic equation? Explain how to solve a quadratic by factoring.

\_\_\_2.3 What is a complex number and when are you likely to see one?

\_\_\_2.4 Explain when it is appropriate to solve a quadratic by taking the square root. When is it appropriate to solve a quadratic using the quadratic formula?

\_\_\_2.5 Explain how to reveal the vertex of a quadratic expression using the process of completing the square.

\_\_\_2.6 How do you recognize when a context, or word problem, requires a system of equations in order to solve it? Give an example.

**Unit 3: Radicals**

\_\_\_3.1 Explain how expressions with rational exponents can be rewritten as radical expressions.

\_\_\_3.2 Justify why the product of two rational numbers must be a rational number.

\_\_\_3.3 Compare and contrast the domain and range, rate of change and intercepts of a radical function versus a quadratic function. Include specific functions in your examples.

\_\_\_3.4 Why does the process of algebraically solving a radical equation sometimes produce an extraneous solution? Give an example.

\_\_\_3.5 Explain the process for solving a system of inequalities that involves one linear and one quadratic equation. Give an example.

**Unit 4: Geometric Transformations**

\_\_\_4.1 Explain the Midpoint Segment Theorem and Angle Bisector Theorem and provide examples for each.

\_\_\_4.2 What is the Triangle Inequality Theorem and how can you use it to find the possible lengths of a side of a triangle when given the lengths of the other two sides?

\_\_\_4.3 Describe how to perform a translation on a geometric figure. Include vector notation in your discussion, as well as both a graph and a table in your example.

\_\_\_4.4 Describe how to perform a reflection on a geometric figure. Include the proper notation in your discussion, as well as both a graph and a table in your example. Be sure to include lines of reflection other than the x- or y- axis.

\_\_\_4.5 Describe how to perform a rotation on a geometric figure. Include the proper notation in your discussion, as well as both a graph and a table in your example. Be sure to include the difference between CW and CCW rotations.

\_\_\_4.6 What is a similarity transformation? Describe how to perform a dilation on a geometric figure. Include the proper notation in your discussion, as well as both a graph and a table in your example. Be sure to describe the process for finding the scale factor.

**Unit 5: Geometric Proofs**

\_\_\_5.1 Explain the difference between congruence and similarity? Provide examples and non-examples.

\_\_\_5.2 Describe all angle relationships created by cutting a pair of parallel lines by a transversal. Include a numbered diagram to reference in your discussion.

\_\_\_5.3 What is a proof? Explain the process for completing a 2-column formal proof in which you show that two triangles are congruent. Include the difference between a postulate and a theorem.

\_\_\_5.4 Create a flow proof that justifies each step for solving a multistep equation of your choice.

**Unit 6: Trigonometry**

\_\_\_6.1 What are the two special right triangles that were discussed in this unit, and explain the rules for finding their side lengths. Include an example of each kind of problem.

\_\_\_6.2 What are the trigonometric ratios of a right triangle and how do we use them? Include a diagram in your explanation along with an example of solving a problem using a trig ratio.

\_\_\_6.3 When do you use an inverse trig ratio? Include examples.

\_\_\_6.4 Provide a real world scenario in the form of a word problem that requires the use of trigonometry to solve, then solve it.

**Unit 7: Probability**

\_\_\_7.1 Define theoretical probability and experimental probability. What do we notice when we increase the trials of an experiment? Include an example.

\_\_\_7.2 Explain the Fundamental Counting Principle and provide an example.

\_\_\_7.3 What is the difference between an independent and a dependent event? How does this affect the way we **count the total number of outcomes**?

\_\_\_7.4 How do independent vs dependent events change the **probability of a single outcome**?