

ALGEBRA I

Unit Four Project: "Simplifying Polynomials"

OBJECTIVES:

- ✓ **Write, simplify, and evaluate expressions in exponential form.**
- ✓ **Add & subtract polynomials**
- ✓ **Multiply with monomials**
- ✓ **Multiply with polynomials**
- ✓ **Rewrite formulas**
- ✓ **Problem solve with rates and area**

In this unit, you will be spending time simplifying polynomials. You will be given a series of problems to complete that showcase your learning along the way. Complete the parts of the project as we go through the lesson; therefore, each item will be scored individually.

*Throughout the unit, you will experience everything you need to learn to complete the series of tasks. **This project is worth 50 points, will be scored using the rubric that follows, and is due the day before the unit one exam.***

1. Write a fifth degree polynomial with three terms.

2. Write a polynomial already in simplest form with four terms and one variable.

3. Explain why (-2) raised to an even power is positive and -2 raised to an odd power is negative.

4. Where did the terms "squared" and "cubed" come from?

5. Fill in the table:

<u>Base</u>	<u>Exponent</u>	<u>Result (Positive or Negative)?</u>
Positive	Even	
Negative	Even	
Positive	Odd	
Negative	Odd	

6. $1,776 = (1 \cdot 10^3) + (7 \cdot 10^2) + (7 \cdot 10^1) + (6 \cdot 10^0)$

Write the following numbers using a similar form.

9,483 =

759 =

80,310 =

7. $6x^2$ written in expanded form shows all factors multiplied: $2 \cdot 3 \cdot x \cdot x$. Expand the following (all numerical factors should be prime):

$125x^3y^2 =$

$80x^5yz^3 =$

$300y^4 =$

8. Write a three term expression that cannot be simplified.
9. Write a three term expression that can be simplified to one term.

Then simplify it!

10. Finish the rules: $a^m a^n = \underline{\hspace{2cm}}$ $(a^m)^n = \underline{\hspace{2cm}}$

11. Write an expression that shows the perimeter and the area of the given objects.

Perimeter =

Area =

Perimeter =

Area =

12. Complete the rectangles by multiplying. Then show your answer in simplest form below each.

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13. Work backwards! Given the terms in the rectangles, fill in the expressions that were multiplied to get all of the terms!

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14. The formula for interest is $I = PRT$ where P is principal (what you start with), R is rate (written as a percentage... $3\% = .03$), and T is time in years. Do the following:

Rewrite the formula in terms of T .

How long will it take to earn \$1,000 in interest if you start with \$5,000 at an interest rate of 2%? Show your computations but use a calculator!

How long will it take to earn \$5,000 in interest if you start with \$5,000 at an interest rate of 2%? (doubling your money) Show your computations but use a calculator!

How long will it take to earn \$5,000 in interest if you start with \$5,000 at an interest rate of 5%? (doubling your money) Show your computations but use a calculator!

Based on your findings in this question, what are the factors that increase the amount of interest earned?

15. A rectangular swimming pool must be put in with its length 20 feet more than its width. A path 5 feet wide will be placed around the pool. If the area of the path is 1,000 square feet, determine the length and the width of the pool.

Draw a picture!

Label the picture!

Write an equation showing the relationship.

Solve the equation.

Length = _____ Width = _____

16. Solve $ab - cd = x$ for a . 17. Solve $a + b - c = d$ for a .
18. Solve $\frac{a+d}{c} = b$ for a . 19. Solve $52(a - 2bc) = d$ for a .
20. Alice and Bjorn begin 50 miles away from each other. Alice is driving at 50 miles per hour in slow traffic while Bjorn is driving 70 miles on the interstate. How long will it take (in minutes) for them to meet?

Write an equation showing the relationship, solve, and change your answer to minutes!