

Dear Algebra 1 Students and Parents,

The Algebra teachers here at Ponderosa High School would like to provide you with the best math education we possibly can. We are pleased to offer an **Algebra 1 textbook** that is aligned closely with the **Common Core State Standards**, which we hope will be both challenging and engaging.

As a student, you will be given the opportunity to study and understand algebra in great depth. You will learn both the concepts of algebra and the skills of algebra. The **concepts** are the big ideas, the reasons why things work like they do, and the ways math fits together as a whole. The **skills** of algebra are the tools we use to solve problems, the answers to "how do we do this?" Below is a list of the 20 skills you will need to become experts at this year.

You may even already know some of these!

- Skill 1: Solve Multiple-step Equations
- Skill 2: Solve Proportions
- Skill 3: Solve and Graph Compound Inequalities
- Skill 4: Solve and Graph Absolute Value Inequalities and Equations
- Skill 5: Evaluate and Graph a Function
- Skill 6: Graph a Linear Equation
- Skill 7: Write the Equation of a Line, Given Two Points
- Skill 8: Write the Equation of a Line Parallel or Perpendicular to a Given Line Through a Given Point
- Skill 9: Solve a System of Linear Equations by Graphing
- Skill 10: Solve a System of Linear Equations Algebraically
- Skill 11: Solve a System of Linear Inequalities by Graphing
- Skill 12: Simplify Expressions with Exponents
- Skill 13: Multiply Polynomials
- Skill 14: Factor Trinomials (including GCF and perfect square trinomials)
- Skill 15: Factor Special Cases (including 4 terms and differences of two squares)
- Skill 16: Solve a Quadratic Equation using Factoring
- Skill 17: Solve a Quadratic Equation by Completing the Square
- Skill 18: Solve a Quadratic Equation Using Quadratic Formula
- Skill 19: Multiply and Divide Rational Expressions
- Skill 20: Given Data, Make a Boxplot, Find Mean and Range

Not only will you learn concepts and skills, you will develop these eight important **mathematical practices** that have been identified by the standards:

- MP 1 Make sense of problems and persevere in solving them
- MP 2 Reason abstractly and quantitatively
- MP 3 Construct viable arguments and critique the reasoning of others
- MP 4 Model with mathematics
- MP 5 Use appropriate tools strategically
- MP 6 Attend to precision
- MP 7 Look for and make use of structure
- MP 8 Look for and express regularity in repeated reasoning.

There is a lot to learn in Algebra, so be prepared to work hard! Algebra is also abstract, which can sometimes make it seem like it's not very meaningful. This can make algebra seem difficult, but don't give up! What you learn in algebra tends to build on things you learned previously, so it's a lot like laying bricks for a wall. If any bricks are missing, you will have trouble laying the bricks on the next row above. That means you need to learn all the ideas in algebra so that you can build on them either later in the course or in other courses. Algebra 1 is a High School graduation requirement.

The best way to increase your understanding is to practice, so **complete all assignments!** You should not need help with homework; it will be practice for what you learned in class. Do the best you can on ALL of the problems. **Try every problem, even if you're not sure you did it correctly.** If you get completely stuck, ask someone for help, but NEVER copy another student's paper. That is cheating, and there is a strict school policy about cheating that follows you through all of high school. **Make the decision now that you will never copy someone else's work!** If you cannot complete the full assignment, plan to finish it the next night so that you aren't missing any of the bricks in your algebra wall!

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Things to Remember:

- Materials.** It is strongly recommended that student have the following materials in class each day:
 - **Three-ring binder** for holding and organizing materials and returned work.
 - **Supplementary pages for the current chapter.**
 - **Scientific calculator.** Calculators are permitted on almost everything in Algebra 1. Many activities are difficult or impossible without the use of a calculator, so **do your best to have one and bring it every day.** Cell phone calculators are not acceptable for any math classes at Ponderosa!
- Assessments.** Assessments will be administered every week, typically on block day. Skill tests will be given nearly every week. The skill questions measure performance on 20 of the California State Standards. Each skill is tested for 4 consecutive weeks, with a 5th or 6th try available if needed, and the two highest scores will count toward their grade for the skill. Each student will maintain a Skill Record Sheet where they will record their score on each skill test question. This will provide both students and parents a way to track progress on each skill.

Some weeks the assessments will be a quiz, covering a small amount of material and counting for fewer points. Other weeks the assessment will be a unit test, which covers more material and counts for a larger number of points. Because these unit tests carry the most weight in students' grades, we will be offering students the opportunity to remediate their weaknesses and retake (most of) these tests, up to a maximum score of 80%. To take advantage of these retests, please make whatever arrangements are necessary to make it possible to attend the appropriate remediation sessions!
- Grading Policy.** Parents and students have access to the student's grade through the new Aeries.net system. Each student's grade will be calculated using a weighted grading system.
 - **Homework** will count as 10% of your grade.
 - **Skills** will count as 25% of your grade. (Each skill is tested 4 times and the best 2 tries count.)
 - **Quizzes and Tests** will count as 50%. (Performance tasks 10%, quizzes 10%, tests 30%.)
 - **The Final Exam** will count as 15%. (Given at the end of each semester.)

Grades will be assigned by using one of the following two scales. Please note that a student must receive a grade of C or higher in Algebra 1 in order to take Geometry. Any student receiving Algebra Foundations credit in this course will take Algebra 1 the following year.

Algebra 1 Grading Scale:

90-100%	Algebra 1 : A
80-89%	Algebra 1 : B
70-79%	Algebra 1 : C

55-69%	Algebra Foundation : C

0-54%	Algebra 1 F

Alternate Grading Scale (used if student has already received Algebra Foundations Credit):

90-100%	Algebra 1 : A
80-89%	Algebra 1 : B
70-79%	Algebra 1 : C
60-69%	Algebra 1 : D
0-59%	Algebra 1 F

Note: Students must earn a C or better to advance to the next course, Geometry.

****Students who have previously received high school credit for Algebra Foundations or Pre-Algebra use the Alternate Grading Scale.****

We believe that this algebra course will provide the foundation for learning powerful mathematics. The rest is up to you. **You hold the key to your success.** Make the effort to **develop understanding of algebra** and to **practice what you learn.** If you find yourself falling behind or getting confused, seek extra help early. Ask questions in class, and also get help from parents, friends, or your teacher. May you see the rewards of your work throughout the year, and in the future!

Sincerely,

C Frost

D Fuller

M Loken

K Overman

B Fulp

J Wilkes

L Wilson

Please review the information above and sign below.

Student Name (print): _____ **Signature:** _____

Parent Name (print): _____ **Signature:** _____

1-4

Essential Understanding Relationships that are always true for real numbers are called *properties*, which are rules used to rewrite and compare expressions.

Two algebraic expressions are if they have the same value for all values of the variable(s). The following properties show expressions that are equivalent for all real numbers.



Properties of Real Numbers

Let a , b , and c be any real numbers.

Properties of Addition and Multiplication

Changing the order of the addends does not change the sum. Changing the order of the factors does not change the product.

	Algebra	Example
Addition	<input type="text"/>	<input type="text"/>
Multiplication	<input type="text"/>	<input type="text"/>

Properties of Addition and Multiplication

Changing the grouping of the addends does not change the sum. Changing the grouping of the factors does not change the product.

Addition	<input type="text"/>	<input type="text"/>
Multiplication	<input type="text"/>	<input type="text"/>



Properties Properties of Real Numbers

Let a be any real number.

Properties of Addition and Multiplication

The sum of any real number and 0 is the original number. The product of any real number and 1 is the original number.

	Algebra	Example
Addition	<input type="text"/>	<input type="text"/>
Multiplication	<input type="text"/>	<input type="text"/>

Property of Multiplication

The product of a and 0 is 0.

<input type="text"/>	<input type="text"/>
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Multiplication Property of

The product of -1 and a is $-a$.

<input type="text"/>	<input type="text"/>
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Match each property name to its example



Example

Property Name

$$3 + (4 + 5) = (3 + 4) + 5$$

Commutative, Multiplication

$$3 + 7 = 7 + 3$$

Associative, Multiplication

$$33(14) = 14(33)$$

Commutative, Addition

$$(9 \cdot 5) \cdot 7 = 9 \cdot (5 \cdot 7)$$

Inverse, Multiplication

$$-\frac{2}{3} \cdot -\frac{3}{2} = 1$$

Associative, Addition



Match each property name to its example



Example

Property Name

$$25 + 0 = 25$$

Distributive

$$-18(-1) = 18$$

Identity, Multiplication

$$3 + (-3) = 0$$

Inverse, Addition

$$-23 \cdot 1 = -23$$

Multiplication Property of -1

$$54,321 \cdot 0 = 0$$

0 Property of Multiplication

$$5(3 - 9) = 5(3) - 5(9)$$

Identity, Addition


Problem 3 Writing Equivalent Expressions

Simplify each expression.

A $5(3n)$

$$5(3n) = (5 \cdot 3)n$$

$$= 15n$$

B $(4 + 7b) + 8$

$$(4 + 7b) + 8 = (7b + 4) + 8$$

$$= 7b + (4 + 8)$$

$$= 7b + 12$$

C $\frac{6xy}{y}$

$$\frac{6xy}{y} = \frac{6x \cdot y}{1 \cdot y}$$

$$= \frac{6x}{1} \cdot \frac{y}{y}$$

$$= 6x \cdot 1$$

$$= 6x$$

HW p 27: 7-12, 32-35, 39-45

and get Alg 1 course info sheet signed

Name the property that each statement illustrates.

 See Problem 1

7. $75 + 6 = 6 + 75$

8. $\frac{7}{9} \cdot 1 = \frac{7}{9}$

9. $h + 0 = h$

10. $389 \cdot 0 = 0$

11. $27 \cdot \pi = \pi \cdot 27$

12. $9 \cdot (-1 \cdot x) = 9 \cdot (-x)$

Use deductive reasoning to tell whether each statement is *true* or *false*.

 See Problem 4.

If it is false, give a counterexample. If true, use properties of real numbers to show the expressions are equivalent.

32. For all real numbers r , s , and t , $(r \cdot s) \cdot t = t \cdot (s \cdot r)$.

33. For all real numbers p and q , $p \div q = q \div p$.

34. For all real numbers x , $x + 0 = 0$.

35. For all real numbers a and b , $-a \cdot b = a \cdot (-b)$.

Tell whether the expressions in each pair are equivalent.

38. $2 + h + 4$ and $2 \cdot h \cdot 4$

39. $9y \cdot 0$ and 1

40. $3x$ and $3x \cdot 1$

41. $m(1 - 1)$ and 0

42. $(9 - 7) + \pi$ and 2π

43. $(3 + 7) + m$ and $m + 10$

44. $\frac{63ab}{7a}$ and $9ab$

45. $\frac{11x}{(2 + 5 - 7)}$ and $11x$

46. $\frac{7t}{4 - 8 + \sqrt{9}}$ and $7t$