

SUMMER MATH PREP WORK FOR STUDENTS ENTERING ALGEBRA 2



NAME: _____

SUMMER PREP WORK HELP

8/2, 8/9, AND 8/16

2:45PM - 3:45PM

BOLGER MEDIA CENTER

Mr. Rosenberg will be there on 8/2

Mrs. Keelen will be there on 8/9 & 8/16



KEANSBURG

HIGH SCHOOL

www.keansburg.k12.nj.us

140 Port Monmouth Rd, Keansburg, NJ 07734

Phone: 732-787-2007 x4200

Fax: 732-495-5401

Principal
Ms. Jennifer Vecchiarelli

Vice Principal
Mr. Dennis O'Keefe

Director of Athletics
Mr. Thomas Stark

ALGEBRA 1, GEOMETRY, & ALGEBRA 2 SUMMER PREP WORK

This prep work should be completed, to the best of your ability, by the first day of school. If provided, Big Ideas and Google Classroom will have helpful resources (textbook, tutorials, etc.) to assist you with the completion of the prep work. Please note that all of the material in the prep work was covered in previous math classes; there are no excuses.

This prep work will be checked on the first day of class and will be collected on the second day of class. **The prep work will count as your first CLASSWORK grade for the year.**

The next page contains skills and mathematical ideas that you are expected to have a good understanding of in order to be successful in your next course. It is important that you are able to complete these skills both with and without a calculator. This prep work has been designed to specifically target the skills listed in order to help you become better prepared for your next course.

Google Classroom Code: _____

- (1) Sign into your school email & go to Google Classroom (classroom.google.com).
- (2) Click the "+" in the top bar and type the code.

Big Ideas Code: _____

Already Have a Username & Password?

- (1) Go to bigideasmath.com
- (2) Sign in using your information
- (3) Click your name in the top right
- (4) Click "Add Class" and enter code above

Need a Username & Password?

- (1) Go to bigideasmath.com
- (2) Click "New to Big Ideas Math?"
- (3) Enter the code above & create a login

BEFORE ENTERING ALGEBRA 2, ...
YOU ARE EXPECTED TO KNOW THE SKILLS BELOW:

- **Simplifying polynomial expressions**
- **Solving multi-step equations & systems of equations (including distribution), solving proportions, and factoring**
- **Rules of exponents**
- **Simplifying radicals and rationalizing the denominator**
- **Knowledge of the coordinate plane and graphing linear functions**
- **Regression and Use of the Graphing Calculator**

YOU ARE EXPECTED TO KNOW THE MATHEMATICAL IDEAS BELOW:

Seeing Structure in Expressions

- Interpret the structure of expressions
- Write expressions in equivalent forms to solve problems

Arithmetic with Polynomials and Rational Functions

- Perform arithmetic operations on polynomials
- Understand the relationships between zeros and factors of polynomials
- Use polynomial identities to solve problems
- Rewrite rational functions

Creating Equations

- Create equations that describe numbers or relationships

Reasoning with Equations and Inequalities

- Understand solving equations as a process of reasoning and explain the reasoning
- Solve equations and inequalities in one variable
- Solve systems of equations
- Represent and solve equations and inequalities graphically

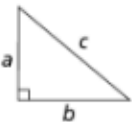
Mathematical Practices

- Make sense of problems and persevere in solving them
- Reason abstractly and quantitatively
- Construct viable arguments and critique the reasoning of others
- Model with mathematics
- Use appropriate tools strategically
- Attend to precision
- Look for and make use of structure
- Look for and express regularity in repeated reasoning

ALGEBRA 1, GEOMETRY, & ALGEBRA 2 SUMMER PREP WORK REFERENCE SHEET

Key	
b = base	d = diameter
h = height	r = radius
l = length	ℓ = slant height
w = width	B = area of base
	P = perimeter of base
Use 3.14 or $\frac{22}{7}$ for π .	

Formulas for Area	
Triangle	$A = \frac{1}{2}bh$
Rectangle	$A = lw$
Trapezoid	$A = \frac{1}{2}h(b_1 + b_2)$
Parallelogram	$A = bh$
Circle	$A = \pi r^2$

Linear Equation Forms
<u>Point-Slope Form:</u> $y - y_1 = m(x - x_1)$
<u>Standard or General Form:</u> $Ax + By = C$
<u>Slope-Intercept Form:</u> $y = mx + b$
Pythagorean Theorem
 $c^2 = a^2 + b^2$

Coordinate Geometry
Given: Points $A(x_1, y_1)$, $B(x_2, y_2)$
<u>Distance between two points:</u> $AB = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
<u>Midpoint between two points:</u> Midpoint of $\overline{AB} = \left(\frac{x_2 + x_1}{2}, \frac{y_2 + y_1}{2}\right)$
<u>Slope of line through two points:</u> $m = \frac{y_2 - y_1}{x_2 - x_1}$
Quadratic Formula
$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Formulas for Volume and Area of Solids		
Solid	Volume	Total Surface Area
Right Circular Cone	$V = \frac{1}{3}\pi r^2 h$	$T = \frac{1}{2}(2\pi r)\ell + \pi r^2 = \pi r\ell + \pi r^2$
Pyramid	$V = \frac{1}{3}Bh$	$T = B + \frac{1}{2}P\ell$
Sphere	$V = \frac{4}{3}\pi r^3$	$T = 4\pi r^2$
Right Circular Cylinder	$V = \pi r^2 h$	$T = 2\pi r h + 2\pi r^2$
Right Prism	$V = Bh$	$T = 2B + Ph$

CONVERSIONS

1 inch = 2.54 centimeters	1 kilometer = 0.62 mile
1 meter = 39.37 inches	1 pound = 16 ounces
1 mile = 5280 feet	1 pound = 0.454 kilograms
1 mile = 1760 yards	1 kilogram = 2.2 pounds
1 mile = 1.609 kilometers	1 ton = 2000 pounds
1 cup = 8 fluid ounces	
1 pint = 2 cups	
1 quart = 2 pints	
1 gallon = 4 quarts	
1 gallon = 3.785 liters	
1 liter = 0.264 gallon	
1 liter = 1000 cubic centimeters	

Additional Formulas

Arithmetic Sequence	$a_n = a_1 + (n - 1)d$
Geometric Sequence	$a_n = a_1 r^{n-1}$
Geometric Series	$S_n = \frac{a_1 - a_1 r^n}{1 - r}$ where $r \neq 1$
Radians	1 radian = $\frac{180}{\pi}$ degrees
Degrees	1 degree = $\frac{\pi}{180}$ radians
Exponential Growth/Decay	$A = A_0 e^{k(t-t_0)} + B_0$
Circumference of a Circle	$C = \pi d$ or $C = 2\pi r$

Algebra 2 Summer Packet

Show all work for each question in order to receive credit. No work = No credit 😊

1. Evaluate the expression $33r + 7$, when $r = 3$

2. Evaluate the expression $y^2 + 9$, when $y = 19$

3. Evaluate the expression $\frac{4}{7}t$, when $y = \frac{1}{3}$

4. Evaluate the expression 2^n , when $n = 6$

5. Evaluate the expression $512 - 3(42 - 7 + 19)$

6. Evaluate the expression $330 \div (7^2 - 19)$

7. Evaluate the expression $\frac{(6+8^2)}{5} + 1$

8. $\frac{5}{9} + \frac{3}{7}$

9. $14.3(-0.2) + 6.7$

10. $-31.5 \div (3.5)$

11. $\frac{3}{5} \times \frac{5}{8}$

12. Expression 72% as a fraction in simplest form.

13. Expression 88.4% as a decimal

14. 30 is what percent of 150?

15. 91 is 50% of what number?

16. What number is 25% of 648?

17. Translate the verbal phrase “The quotient of five, and a number plus forty two” into an algebraic expression.

18. Translate the verbal phrase “Four less than the quantity of seven times a number plus four” into an algebraic expression.

19. Translate the verbal phrase “fifteen more than the quotient of five and a number is sixteen” into an equation, then solve.

20. Solve for the variable:

$$13x - 34 = 105 + x + 5$$

21. Solve for the variable:

$$12 - 17x = -2x - 22x + 61$$

22. Solve for the variable:

$$3y + 5 - 5y + 56 = 121$$

23. Solve for the variable:

$$-4(2x - 6 + 3) = -20$$

24. Solve for the variable:

$$\frac{(x-9)}{5} = 15$$

25. Use FOIL to multiply

$$(x + 7)(x - 5)$$

26. Use FOIL to multiply

$$(4x - 7)(2x + 2)$$

27. Calculate the slope of a line containing the following points: (2, 10) and (1, 5)

28. Calculate the slope of a line containing the following points: (-3, -2) and (5, -8)

29. Solve the following proportion:

$$\frac{6}{x-9} = \frac{12}{18}$$

30. Solve the following proportion:

$$\frac{x+2}{26} = \frac{x-1}{13}$$

31. State the domain and range of the relation. Then determine whether the relation is a function. Write yes or no. $\{(4,5), (5,-1), (0,12), (0, -2), (7,9)\}$.

32. Factor the polynomial: $x^2 - 4x - 12$

33. Factor the polynomial: $t^2 - 36$

34. Factor the Polynomial: $25x^2 - 20x + 4$

35. Determine whether you would use a permutation or a combination to solve the following situation, then solve: How many ways can 15 people finish a race in 1st, 2nd, and 3rd place?

36. Solve the following inequality and graph on a number line: $6x + 5 \geq 7x$

37. Solve the following inequality and graph on a number line: $-2x - 4 \leq 18$

38. Write the equation of a line that passes through points (6, 2) and (-2, 6) in slope intercept form. (Hint: use reference sheet for slope formula and slope intercept form)

39. Write the equation of a line that passes through points (-2, -2) and (5, 5) in slope intercept form. (Hint: use reference sheet for slope formula and slope intercept form.)

40. Determine if the lines are parallel, perpendicular, or neither:

Line 1: $y = -\frac{1}{2}x + 7$

Line 2: $y = 2x - 4$

41. Determine if the lines are parallel, perpendicular, or neither:

Line 1: $y = 5x + 20$

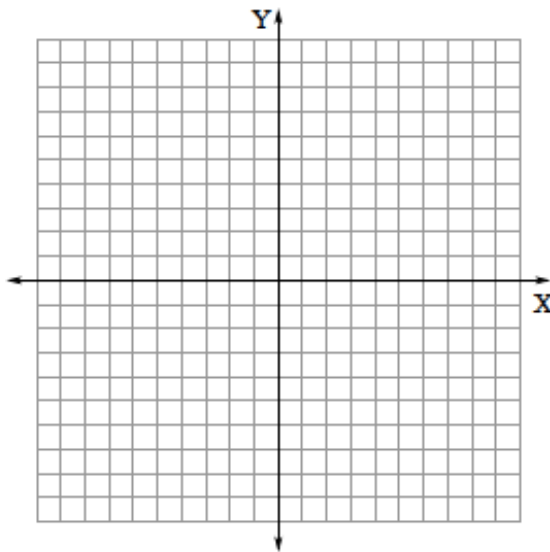
Line 2: $y - 7x = 2x - 10$

42. Find the intercepts of the line: $9x + 3y = 18$

x-int: _____

y-int: _____

43. Sketch a graph of the line $x - 2y = 4$ on the coordinate plane below. Use at least three points:



44. Solve the following system of equations using elimination. Write your answer as an ordered pair. Show all work:

$$\begin{aligned} 2x + 7y &= -1 \\ -x - 2y &= 2 \end{aligned}$$

45. Solve the following system of equations using substitution. Write your answer as an ordered pair. Show all work:

$$\begin{aligned} 3x - y &= 9 \\ 2x + 5y &= -11 \end{aligned}$$

46. Multiply, then combine like terms:

$$(x^2 + 3)(x^2 - 4x + 5)$$

47. Factor completely: $4x^5 - 8x^4 - 96x^3$

48. Use the quadratic formula to solve the equation below. (formula: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$)

$$2x^2 - 5x - 12 = 0$$

49. Solve the equation by factoring:

$$x^2 - 7x + 10 = 0$$

50. Simplify: $2\sqrt{48x^4}$