

Ocean City High School Summer Assignment 2021

Course	Honors Algebra 2	Teacher	Mr. Rainear, Mrs. Clarke
Email	srainear@ocsdnj.org; eclarke@ocsdnj.org	Due Date	-September 1 for Part 1 -First Day of school for Part 2
Standards	A-APR.1, A-REI.3, A-REI.4, A-REI.5, A-REI.6, A-REI.12		
Topic	Graphing Linear Functions, Solving Linear Equations/Inequalities, Solving Systems of Linear Equations/Inequalities, Solving Compound Inequalities, Solving Absolute Value Equations/Inequalities, Simplifying Polynomial Expressions, Factoring Quadratic Expressions, Solving Quadratic Equations By Factoring		
Purpose	The purpose of this assignment is to refresh and enrich students' knowledge on the basic Algebra 1 and Geometry skills that are required to succeed in Honors Algebra 2. This assignment consists of two components; one online and one with paper and pencil. Please read ALL of the instructions given at the beginning of the Summer Assignment.		
Text/Novel(s) & Brief Description	NA		
Approximate Time on Task	Approximately 8 hours		
Suggested Timeline	Early to mid August would be an appropriate time to start. The assignment is due on the first day class meets.		
How It Will Be Assessed	<p>This assignment will be given a quiz grade (30 points) based on the scoring rubric included in the introduction. AGAIN, Please read ALL of the instructions given at the beginning of the Summer Assignment. The first rotation of the school year will be used to review this material. After review, there will be a summative assessment on the material.</p> <p>This material is a review of basic skills from Algebra 1 that you are expected and required to have mastered for this course. This material and can be found in any Algebra 1 book and on the internet.</p> <p>Mr. Rainear has made a series of instructional videos that are aligned with this assignment. They can be found at https://www.sophia.org/playlists/summer-assignment-tutorials.</p>		

Dear Incoming Honors Algebra 2 Students,

We look forward to seeing all of you in September and beginning a year of challenging and exciting work in higher mathematics. The attached summer assignment is designed to refresh and enrich your knowledge of past material to help you prepare for Honors Algebra 2. As you complete the assignment, please keep the following expectations in mind. The mastery of these skills are essential to having a successful year in Honors Algebra 2.

EXPECTATIONS OF INCOMING STUDENTS

- 1) Advanced proficiency in basic arithmetic **WITHOUT** the use of a calculator. (addition/subtraction/multiplication/division of positive and negative integers, **DECIMALS, AND FRACTIONS**).
- 2) Advanced proficiency in simplifying algebraic expressions. (Combining like terms, distribution with respect to multiplication **AND DIVISION**, laws of exponents, simplifying radical expressions, multiplying polynomials, etc.)
- 3) Advanced proficiency in solving linear equations and inequalities, including absolute value. (**WITH FRACTIONS INVOLVED!!**)
- 4) Advanced proficiency in analyzing linear functions. (Graphing a line, converting functions from standard form to y-intercept form and vice versa, identifying slope and the y-intercept in a function in slope-intercept form, identifying slope and a point of a function in point-slope form, recognizing if a line rises to the left or the right by its slope, finding the x-intercept of a line, identifying functions of vertical and horizontal lines, identifying the relationship of parallel lines and perpendicular lines with respect to their slopes, writing equations of lines in point-slope form or slope-intercept form)
- 5) Proficiency at applying the above mentioned skills to problem solving applications. (Word Problems.)
- 6) Proficiency in solving systems of linear functions using the Substitution Method and the Linear Combination Method.
- 7) Proficiency in factoring quadratic expressions.
- 8) Proficiency in solving quadratic equations by factoring.

- 9) Proficient knowledge of geometric relationships. (Pythagorean Theorem, 30-60-90 triangles, 45-45-90 triangles, 3, 4, 5 triangles (and multiples of), 5, 12, 13 triangles (and multiples of), Similar shapes, Congruency, Formulas for basic geometric shapes (area of triangle, square, rectangle, trapezoid, circle, volumes of rectangular prisms, etc...)

Beyond this, students are expected to be self-motivated, organized and willing to devote time to practice. We will help you in any way we can but again, it is essential and critical to your success in the course that you come into this class equipped with the above mentioned skills and traits.

CALCULATORS

We suggest acquiring a Texas Instrument Graphing Calculator; specifically a TI-83+ or TI-84+. This is the standard calculator used at most high school and colleges throughout the country and we will be using it often and exclusively in class this upcoming year. They can be bought new at most department stores such as Target, or at electronic stores such as Best Buy or Staples for approximately \$100.00. Used ones can be bought on E-Bay for usually \$50-\$60. If there is a difficulty in getting a TI-83+/84+, please contact us via school email.

ABOUT THE ASSIGNMENT

The summer assignment consists of two components and will be scored as a 30 point quiz. The DeltaMath portion of the assignment is due at 8AM on September 1. The written portion is due the first day of school.

The first component is an online component using DeltaMath. The assignment is titled "OCHS Honors Algebra 2 Summer Assignment Part 1". To access this assignment you must have a deltamath.com account.

Many of you already have one from your previous teacher. If this is the case then after you log in, click on "Add Teachers", enter the code 479663 and enter the proper class, "Honors Algebra 2 Summer Assignment"

For those of you who do not have an account from a former class, you will need to create a new account. Click on "Create New Account", enter the code 479663 and enter the proper class, "Honors Algebra 2 Summer Assignment"

IF THERE ARE ANY ISSUES WITH ACCESSING THE DELTAMATH.COM PORTION OF THE ASSIGNMENT, IT IS YOUR RESPONSIBILITY TO LET MR. RAINEAR (srainear@ocsdnj.org) OR MRS. CLARKE (eclarke@ocsdnj.org) KNOW ASAP!!!

The second component is attached to this informational letter. All the work for the problems in this component should be shown (when necessary) in an

organized fashion to enable your instructor to read it. It will be collected by your teacher on the first day of school.

As previously stated, The assignment will be scored as a 30 point quiz based on the following rubric:

Score	Criteria
Part 1-DeltaMath.com (15 POINTS)	
Students will complete the online deltamath.com portion of the project. The score on this portion will be 50% of the summer project grade.	
Part 2- Written Problem Set (15 POINTS)	
Students should complete the written problem set portion of the assignment. The score on this portion (see rubric below) will be 50% of the summer assignment grade.	
15 POINTS	The problem set has a complete response to each question with all work shown. The work has no math errors and shows complete understanding of the questions, mathematical ideas, and processes.
12 POINTS	The problem set has a good solid response to each question with work shown. The work has no major math errors or serious flaws in reasoning and shows substantial understanding of the problem, ideas, and processes.
9 POINTS	The problem set has a response to each question with work shown. Work may contain some misunderstandings or the explanations may lack clarity, but overall shows a basic understanding of the problem, ideas, and processes
6 POINTS	The problem set has incomplete or missing responses to some questions and work is unclear. The work includes some serious math errors or flaws in reasoning and the responses show only some understanding of the problem.
3 POINTS	The problem set responses miss key points or several components of the assignment are not completed. The work includes major math errors or serious flaws in reasoning with responses showing a complete lack of understanding for the problem
0 POINTS	The assignment is not handed in.

Late Work

All late assignments will be graded according to the above criteria. Once a grade has been determined, the student will lose 5 points for each day the project is late.

Example: If the students receives a 3, which is 85%, and hands the project in 2 days late, their final grade will be 75%. They lost 5 points for each of the 2 days late for a total of 10 points deducted.

RESOURCES

The solutions to this assignment are located at the end of the packet. Check your answers as you progress through the packet to ensure you are doing the problems correctly. However, as stated earlier, ALL SUPPORTING WORK MUST BE SHOWN (WHEN NECESSARY)!!

While working on the summer packet, you may need reference sources. Mr. Rainear has made a series of video tutorials that can be accessed on a website named Sophia.org. The link to the tutorial playlist is <https://www.sophia.org/playlists/summer-assignment-tutorials>.

Another good online source is <http://www.purplemath.com>.

Have a great summer and e-mail either of us at srainear@ocsdnj.org or eclarke@ocsdnj.org if there are any questions regarding the summer assignment.

Sincerely,
Mr. Rainear
Mrs. Clarke

Honors Algebra 2 Instructors

SUMMER ASSIGNMENT PART 2

Directions: You are to do this summer assignment WITHOUT A CALCULATOR. We will start reviewing this material on the first day of school and you will have an assessment on it the following rotation. SHOW ALL WORK (WHEN NECESSARY) IN AN ORGANIZED FASHION WHERE APPROPRIATE AND NOTATE WHERE YOU HAVE QUESTIONS.

1) Which of these is equivalent to the expression $-\frac{2}{3}\left(5x - \frac{3}{5}\right)$?

(A) $\frac{-50x - 9}{15}$

(B) $\frac{-8x + 45}{60}$

(C) $-\frac{50x - 6}{15}$

(D) $\frac{-50x + 6}{15}$

2) Simplify the expression $6 - (2x - 3)(x + 1) - \left(\frac{4x^2 - 8x - 16}{4}\right)$

3) Simplify the following expression: $\sqrt{32} - 2\sqrt{2} + 3\sqrt{3} + \sqrt{27}$

4) Simplify $x^{-2} \cdot x^2$

5) Simplify $(2a^5b^4)^3 \cdot (3a^2b)^2$

6) Simplify $\frac{8x^4y^2}{16xy^5}$

7) Simplify $(3x + 2y)^2$

8) Rewrite the following expression without negative exponents and simplify:

$$\left(\frac{3^{-2}xy^{-3}}{x^2y^{-2}}\right)^{-2}$$

9) Solve the equation: $3 - (x - 4) = 2x + 1$

10) Solve the equation: $2 - 4(x + 1) = 3 - 2(2x - 2)$

11) Suppose $2(2 - y) = 3x$. Rewrite the equation in terms of y .

12) If $f(x) = 3x - 3$, find $f\left(\frac{-1}{4}\right)$

13) If $f(x) = x^2 - \frac{2}{3}$, find $f\left(-\frac{1}{5}\right)$

14) Solve the inequality: $-3x + 8 < 11$

15) Solve the compound inequality $6 \leq 2x - 4 < 10$. Graph your solution on a number line.

16) Solve the compound inequality: $3x - 2 < 4$ or $-2x + 3 < 11$.

17) Solve the inequality: $|2x - 4| < 3$ Graph your solution on a number line

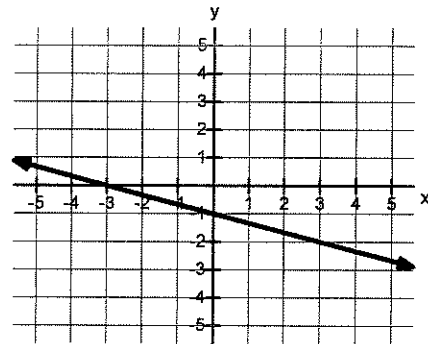
18) Which of these functions has the graph shown here?

A) $f(x) = -3x - 1$

B) $f(x) = \frac{x+3}{3}$

C) $f(x) = \frac{x-3}{3}$

D) $f(x) = \frac{-x-3}{3}$



19) Which of these points does not lie on the graph of $y = -2x + 7$?

A) (-1, 9)

B) (4, -1)

C) (-3, 1)

D) (-2, 11)

20) Between a pair of points on the line $y = 5x - 2$, suppose that the *rise* is 15. Then the run is:

- A) 3
- B) 4
- C) 5
- D) 10

21) Find the slope of the line that passes through the points $(-4, 2)$ and $(6, 6)$. Does it rise to the right or rise to the left?

22) Find the equation IN STANDARD FORM, of the line that passes through the points $(-4, 2)$ and $(6, 6)$.

23) Write the equation of the line IN POINT-SLOPE FORM, of the line with a slope of $m = 2$ and passes through $(3, -4)$

24) Find the slope of the line that passes through the points $(3, 6)$ and $(2, 6)$. Describe what kind of line it is.

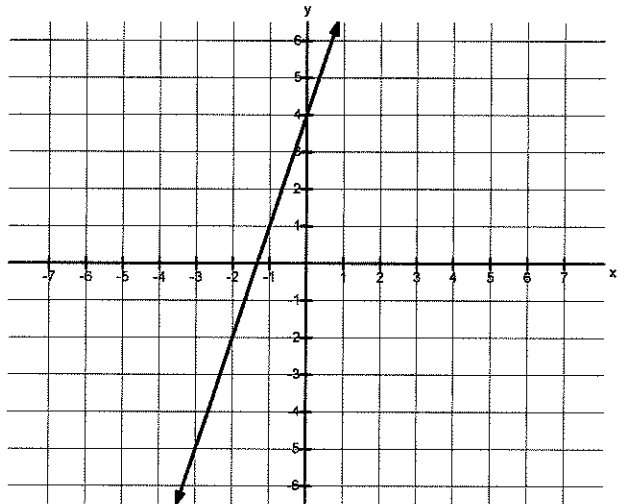
25) Write the equation of the line that passes through the points (3, 6) and (2, 6)

26) Find the slope of the line that passes through the points (2, 4) and (2, 6). Describe what kind of line it is.

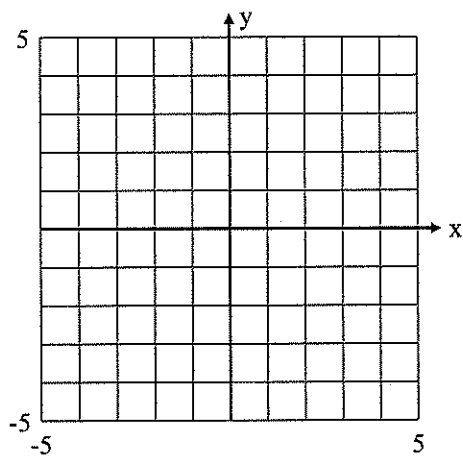
27) Write the equation of the line that passes through the points (2, 4) and (2, 6).

28) Make a table of (x, y) pairs for the given line and write the function it represents in terms of $f(x)$.

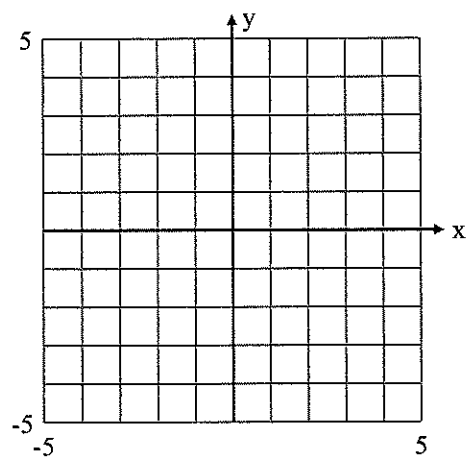
x	$f(x)$



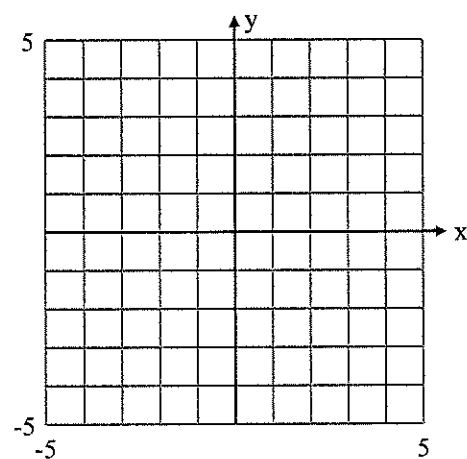
29) Graph the line whose equation is $y = \frac{-x + 4}{2}$



30) Graph the line whose equation is $2x - 3 = -5$



31) Graph the inequality $4x + 2y > -6$



- 32) Write an equation, in slope intercept form, of a line that is perpendicular to $3x + 2y = 7$. (Answers will vary)
- 33) Write an equation of a line that is parallel to $3x - 4y = 6$ and passes through the point $(8, -2)$. Use point-slope form to start and write your final answer in standard form.
- 34) A family membership at a health club costs a flat fee of \$200 plus \$30 per person. If p represents the number of people, then the membership cost can be modeled by the function
- A) $f(p) = 30p + 200$
 - B) $f(p) = 200p + 30$
 - C) $f(p) = 200 + 30 + p$
 - D) $f(p) = 200p$
- 35) John has been saving money on a weekly basis for the past 12 weeks. He started with \$500 in his account and currently has \$1283.
- a) Write an equation to figure out how much John deposits each week and solve.
 - b) Use your answer from part a to write a function $s(t)$ that shows John's savings account after t weeks.

36) Find the intersection of the lines $y = 2x + 1$ and $5x + y = -6$ using the Substitution method.

37) Solve the following system using the Linear Combination method:

$$\begin{cases} 3x - 2y = 8 \\ 4x + 2y = 13 \end{cases}$$

38) Which of these lines does not intersect the line $y = -2x + 3$?

- A) $y = 2x$
- B) $y = 2x - 3$
- C) $y = 2x + 3$
- D) $y = -2x - 3$

39) Factor the following expression: $x^2 + x - 72$

40) Factor the following expression: $2x^3 + 8x^2 + 3x + 12$

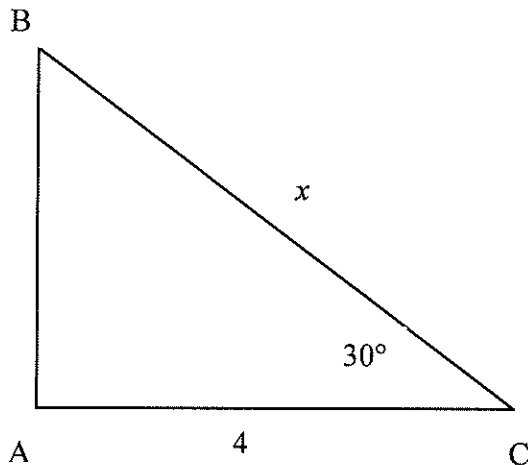
41) Factor the following expression: $4x^2 - 81$

42) Factor the following expression: $9x^2 - 24x + 16$

43) Factor the following expression: $6x^2 - 7x - 10$

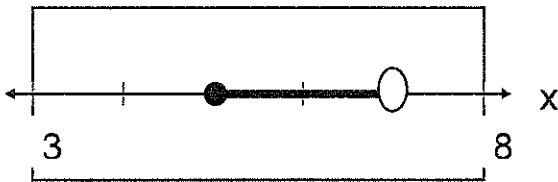
44) Solve the following quadratic equation by factoring: $3x^2 - 11x = -6$

45) Triangle ABC is a right triangle and \overline{AC} has a length of 4. Use your knowledge of 30-60-90 triangles to find the length of \overline{AB} (be sure to rationalize). Then use the Pythagorean Theorem to find the length of \overline{BC} . (again, be sure to rationalize). Does your answer for \overline{BC} agree with the rule for the relationship between the short leg and the hypotenuse of a 30-60-90 triangle? Show all work and explain.

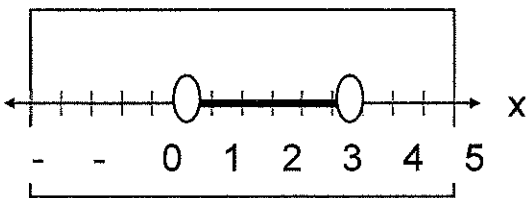


Honors Algebra 2 Solutions to Summer Assignment

- 1) D
- 2) $-3x^2 + 3x + 13$
- 3) $2\sqrt{2} + 6\sqrt{3}$
- 4) 1
- 5) $72a^{19}b^{14}$
- 6) $\frac{x^3}{2y^3}$
- 7) $9x^2 + 12xy + 4y^2$
- 8) $81x^2y^2$
- 9) $x = 2$
- 10) No solution (\emptyset)
- 11) $y = \frac{4-3x}{2}$
- 12) $f\left(\frac{-1}{4}\right) = \frac{-15}{4}$
- 13) $f\left(-\frac{1}{5}\right) = \frac{-47}{75}$
- 14) $x > -1$
- 15) $5 \leq x < 7$



- 16) All real numbers (\mathbb{R})
- 17) $\frac{1}{2} < x < \frac{7}{2}$

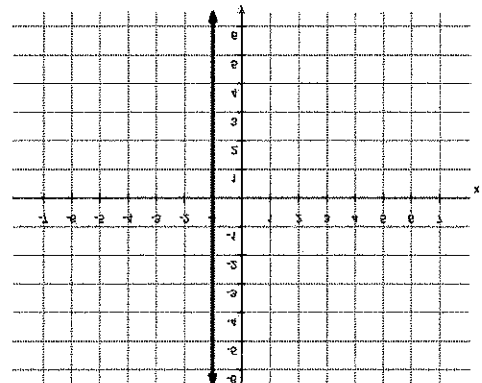


18) D

- 19) C
- 20) A
- 21) $m = \frac{2}{5}$, rises to the right
- 22) $2x - 5y = -18$
- 23) $y + 4 = 2(x - 3)$
- 24) $m = 0$; horizontal line
- 25) $y = 6$
- 26) M=undefined; vertical line
- 27) $x = 2$
- 28) $f(x) = 3x + 4$; Answers will vary for table.

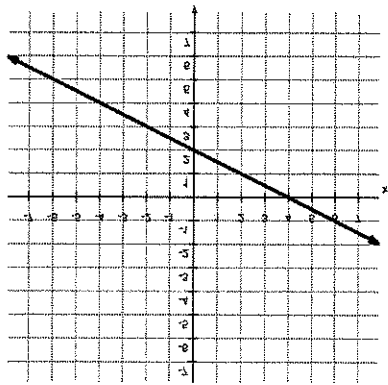
x	f(x)
-3	-5
-2	-2
-1	1
0	4
1	7
2	10
3	13

29)

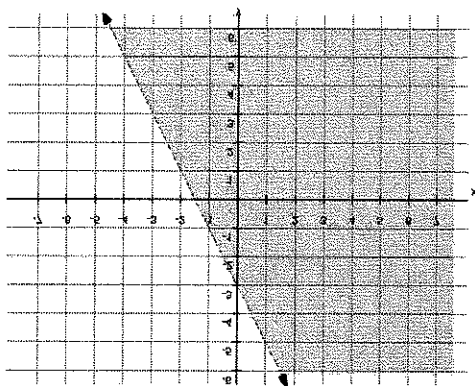


Honors Algebra 2 Solutions to Summer Assignment

30)



31)



32) $y = \frac{2}{3}x + k$ where k is any real number

33) $3x - 4y = 32$

34) A

35)

a) $500 + 12s = 1283$

$s = \$65.25$

b) $s(t) = 65.25t + 500$

36) (-1,-1)

37) $\left(3, \frac{1}{2}\right)$

38) D

39) $(x+9)(x-8)$

40) $(2x^2 + 3)(x+4)$

41) $(2x-9)(2x+9)$

42) $(3x-4)^2$

43) $(6x+5)(x-2)$

44) $x = \frac{2}{3}, x = 3$

45)

$$m_{AB} = \frac{4\sqrt{3}}{3}$$

$$m_{BC} = \frac{8\sqrt{3}}{3}$$

The relationship between the short leg and the hypotenuse of a 30-60-90 triangle is the hypotenuse=twice the short leg.