



BELLEVILLE HIGH SCHOOL

100 PASSAIC AVENUE

BELLEVILLE, NEW JERSEY 07109

WEB-SITE: www.bellevilleschools.org



"Strive, Achieve, Succeed"

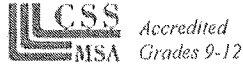
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June 22, 2018

Dear Parents/Guardians and Students:

As a result of the implementation of the New Jersey Student Learning Standards (NJSLs), academic standards have become more rigorous and we would like our students to be able to demonstrate and communicate an in-depth understanding of the topics taught in mathematics. Our goal is not only to have the students master a particular skill, but also to be able to apply these skills in real-life situations.

In the summer time, many necessary mathematical skills are lost due to the absence of daily exposure. The loss of skills may result in a lack of success and unnecessary frustration for students as they begin the new school year. The purpose of this math assignment is to set the stage for instruction for the 2018-2019 school year.

For this reason, a summer packet has been prepared for all current eighth, ninth, tenth, and eleventh graders entering the following classes in September:

1. Algebra I
2. Geometry A and H
3. Algebra 2 A and H
4. Pre-calculus A and H
5. Statistics A and H

Students can access the summer packets for their scheduled course at the Belleville school district's website: www.bellevilleschools.org. Packets can be downloaded and printed out. Work can be done neatly in the packet, with answers clearly labeled. Students may also attach their work, if they choose to do the problems from the packet on separate sheets of paper. Problems must be numbered, all work must be included, and answers must be labeled. If you are unable to access an Internet connection, a limited number of copies will be available at the main office in Belleville High School. Students may also visit the Belleville Public Library to utilize their computers.

The summer assignment will be collected on Thursday, September 6, 2018 and assessed as a quiz grade based on the level of completion. The first week of instruction will be dedicated to covering prerequisite skills required for each course as found in the packet.

Each packet reviews the necessary foundational skills for the course and is accompanied by a study guide that includes both relevant notes and completed examples. Additional help could be found at www.khanacademy.org and <https://www.bellevillelearningacademy.com/>. Khan Academy is a free website for learning academic and real-world knowledge from tutorial videos. It is a great resource where you could find videos and examples from basic algebra through calculus. The Belleville Learning Academy provides student created content specific educational tutorials for peers.

Thank you very much for your support and cooperation. We look forward to working with you next year!

Sincerely,
The Belleville High School Mathematics Department

FOR ALL
STUDENTS
GOING INTO
PRE-CALC./TRIG.
ACADEMIC/HONORS

2018-2019

PRACTICE PROBLEMS

PRECALCULUS/TRIGONOMETRY SUMMER PACKET

To prepare you for the upcoming year, the Mathematics Department has created this summer packet as a means of reviewing important skills and concepts that you have learned. The packet has been divided into different sections. The first nine pages are to be completed by the academic classes and all twelve pages are to be completed by the honors classes. You are responsible for completing this packet on your own. Try and complete most of the assignment without using a calculator. You may use your notes from Algebra 2 and any website resources, such as www.khanacademy.org.

This packet will be collected on Thursday September 6, 2018. All work and final answers should be written in the space provided. However, additional numbered work may be attached to the packet. Be sure to show all work to receive credit. All answers should be exact (simplified fractions and radicals) unless told otherwise.

Table of Contents:

- 1 Coordinate Geometry**
- 2 Factoring and Polynomials**
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- 7 Solving Radical Equations (Honors)**
- 8 Sketching Various Equations (Honors)**
- 9 Exponents and Logarithms (Honors)**

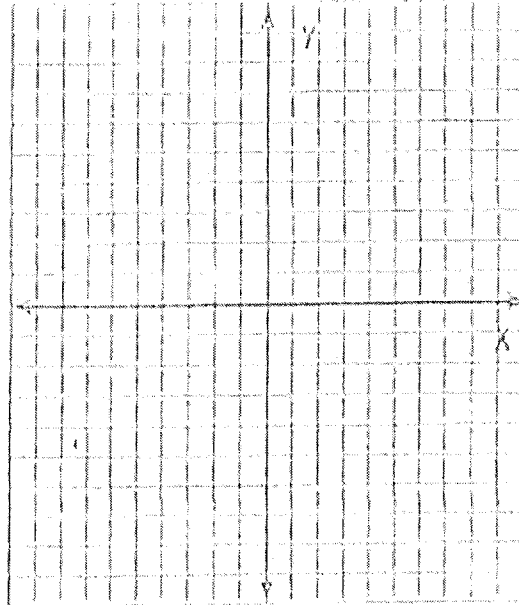
<p>Write the equation of the line with a slope of -11 and a y-intercept of (0,-2).</p> <p>Ans.:</p>	<p>Write the equation of a line with the slope of $\frac{2}{5}$ and passing through (-10,3).</p> <p>Ans.:</p>
<p>Write the equation of the line containing the points (3,7) and (11,-5).</p> <p>Ans.:</p>	<p>Write the equation of the line with zero slope through (-12,5).</p> <p>Ans.:</p>
<p>Write the equation of the line parallel to the y-axis passing through (2,1).</p> <p>Ans.:</p>	<p>Solve the system using substitution.</p> $\begin{cases} -2x + y = 4 \\ 7x - 3y = -13 \end{cases}$ <p>Ans.:</p>

Solve the system using linear combinations
(Elimination).

$$\begin{cases} 2x + 3y = -6 \\ 3x + 4y = -7 \end{cases}$$

Ans.:

Graph $3x + 4y = -12$



2 Factoring and Polynomials

Factor each of the following completely:

$$y^2 - 6y - 40$$

Ans.:

$$3a^2 + 14a + 8$$

Ans.:

$$27x^3 + 8y^3$$

Ans.:

$$5a^2 - 45$$

Ans.:

$$3uw^2 + 24uw + 45u$$

Ans.:

$$2n^3 + 10n^2 - 7n - 35$$

Ans.:

Solve by Factoring

$$x^2 + 13x = 30$$

Ans.:

$$2x^3 - 9x^2 = 0$$

Ans.:

Solve by completing the square:

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

Ans.:

Solve using the Quadratic Formula:

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

Ans.:

Solve using synthetic division: $2x^3 - x^2 - 13x - 6 = 0$

Ans.:

3 Radicals

Simplify (If Possible)

$$2\sqrt{7} - \sqrt{6} - 8\sqrt{7} - 11\sqrt{6}$$

Ans.:

$$\sqrt{27} - 11\sqrt{12}$$

Ans.:

$$\sqrt{2} \cdot \sqrt{10}$$

Ans.:

$$\sqrt{12} \cdot 5\sqrt{3}$$

Ans.:

$$(6\sqrt{5})^2$$

Ans.:

$$\frac{14}{\sqrt{2}}$$

Ans.:

$(7 - 2\sqrt{3})^2$	$\frac{5 - 4\sqrt{3}}{2 + \sqrt{3}}$
Ans.:	Ans.:

4 Complex Numbers

Simplify Each Expression:	
$\sqrt{-36}$	$\sqrt{-48}$
Ans.:	Ans.:
i^{27}	i^{130}
Ans.:	Ans.:
$(4 - 6i) + (11 + 2i)$	$(-12 + 5i) - (2 - 7i)$
Ans.:	Ans.:
$\sqrt{-6} \cdot \sqrt{-15}$	$\frac{5}{2i}$
Ans.:	Ans.:

$\frac{2 - 3i}{5 + 8i}$	<p>Given the complex number $4 - 9i$, identify:</p> <p>Real Part:</p> <p>Imaginary Part:</p> <p>Conjugate:</p>
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5 Functions:

<p>State the domain of each of the following functions:</p>		
$f(x) = 4 - 6x - 7x^3$	$g(x) = \frac{2x-10}{x^2-7x-30}$	$h(x) = \sqrt{3x+8}$
<p>Ans.:</p>	<p>Ans.:</p>	<p>Ans.:</p>
<p>Given the functions below, evaluate each of the following:</p>		
$f(x) = 2x^2 - 3$	$g(x) = 4x + 7$	$h(x) = \frac{6}{x+3}$
$f(-3)$	$g(h(-1))$	$h(f(g(2)))$
<p>Ans.:</p>	<p>Ans.:</p>	<p>Ans.:</p>

For each of the following functions, identify the shape of the graph. Also identify any transformations including shifts and reflections. Be sure to indicate the number of units and the direction.

$$f(x) = -(x + 3)^2$$

Shape:

Transformations:

$$g(x) = (x - 4)^2 + 11$$

Shape:

Transformations:

6 Rational Expressions:

Perform the indicated operation and simplify each expression:

$$\frac{3y}{4 - y^2} \cdot \frac{2y^2 + y - 3}{y^2 - 1} \div \frac{2y^3 + 3y^2}{y^2 - 3y + 2}$$

Ans.:

$$\frac{8}{3x+6} + \frac{5x}{x^2-4}$$

Ans.:

$$\frac{10n}{n^2 - 3n - 4} - \frac{2}{n + 1}$$

Ans.:

Solve the inequalities given. Give exact answers (not decimal approximations).

$$10 > 6 - 2x$$

Ans.:

$$|2x - 3| \leq 11$$

Ans.:

$$\left| \frac{1}{3}x - 2 \right| > 3$$

Ans.:

$$x^2 - 4x + 3 \geq 0$$

Ans.:

HONORS PRECALCULUS

7 Solving Radical Equations:

Solve for x . Simplify all answers.

$$(x + 5)^{\frac{3}{2}} = 125$$

Ans.:

$$(2x - 1)^{\frac{4}{3}} = 81$$

Ans.:

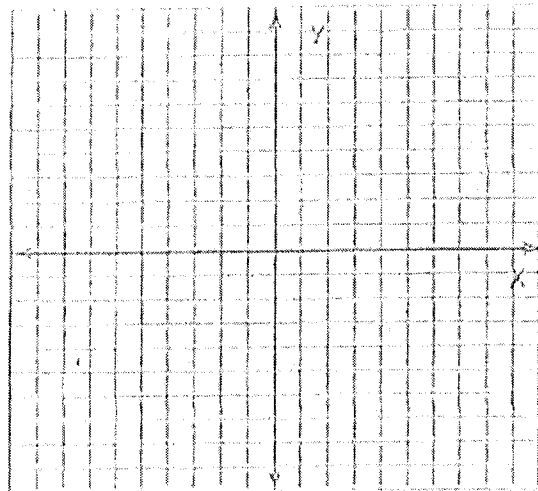
$$\sqrt{16 + 3x} = 2$$

Ans.:

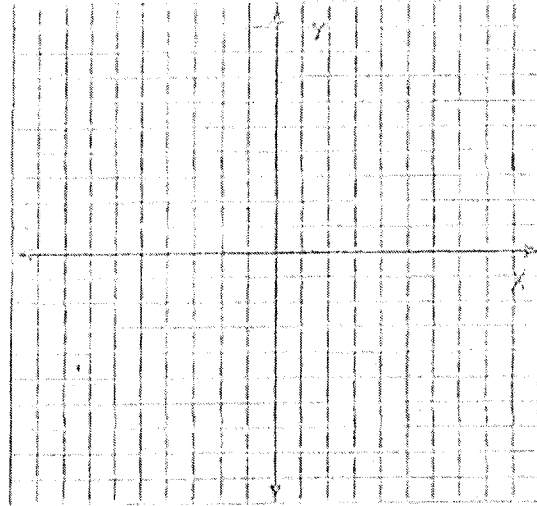
8 Sketching Various Equations:

Sketch the graphs of the following equations. Do not graph on your calculator or similar utility.

$$y = (x + 3)^2 + 1$$



$$y = \left| \frac{1}{2}x + 2 \right| - 3$$



9 Exponents and Logarithms

Perform the indicated operations and give the answers in simplest form (No Calculator)

$$\frac{2x(4x^3y^{-2})^{-2}}{10y^{-3}(x^2y)^3}$$

Ans.:

$$\log_3 81$$

Ans.:

Evaluate these expressions with a calculator. Round to hundredths.

$$\sqrt[3]{300}$$

Ans.:

$$\log_6 50$$

Ans.:

Expand these log expressions.

$$\log_4 16x^2y$$

Ans.:

$$\ln \left(\frac{3x}{z^2} \right)^3$$

Ans.:

Condense these log expressions.

$$\frac{1}{2}(\log x - 3\log y)$$

Ans.:

$$4\ln x + \ln t$$

Ans.:

Solve for x. Use a calculator and round to hundredths, where necessary.

$$\log_x 16 = 5$$

Ans.:

$$\log_7 3x = 4$$

Ans.: