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Dr. Matt Maxwell, Superintendent
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Lemont High School Students and Parents/Guardians,

Because of the sequential nature of mathematics, Lemont High School's Mathematics Department annually makes supplemental practice available to students in the summer. The concepts included are from prior years of school, and this resource is a tool for students to strengthen readiness for the next school year.

The completion of this packet is not required work for the upcoming school year. However, we believe it is important for students to maintain their skills over the summer. This never has been more important.

The packet includes a review of basic mathematics, mathematical concepts, and applications of these concepts. Students should use external resources if they are not familiar with some of the concepts included in this packet. Many of the answers for this packet will be available on the school's website by June.

Please contact me at bzettergren@lhs210.net with any questions. The Mathematics Department wants to continue to provide tools to practice and strengthen the mastery of mathematics.

Sincerely,

Brittany Zettergren
Mathematics Department Chair

Summer Packet in Preparation for Integrated Math 2

This outline serves as a guide for the development of a comprehensive summer packet designed to reinforce and build upon key concepts from Integrated Math I, preparing students for the challenges of Integrated Math II.

Section 1. Numeracy – Exponents, Radicals, Factoring

Section 2. Algebraic Foundations

- Linear Equations and Inequalities
- Systems of Equations

Section 3. Functions and Relations

- Understanding Functions
- Function Operations Addition, subtraction, multiplication

Section 4. Geometry Connections

- Pythagorean Theorem
- Triangle Congruence
- Measures of Angles
- Coordinate Geometry - Distance and midpoint formulas
- Transformations

Section 5. Statistics and Probability

- Data Analysis
- Probability Concepts

Section 6. Problem Solving Practice and Application

Section 1. Numeracy - Exponents, Radicals, Factoring

This material should be completed without a calculator.

1. What value can be placed in each box to create a true statement?

a. $\left(b^{\square}\right)^{5} = b^{15}$ b. $g^{\square} \cdot g^{6} = g^{11}$ c. $\left(a^{2} \cdot a^{\square}\right)^{3} = a^{18}$

2. The set of natural numbers are $\{0,1,2,3,...\}$. Which of these radicals have natural number solutions?

a. $\sqrt{50}$ b. $\sqrt{25}$ c. $\sqrt{9}+\sqrt{4}$ d. $\sqrt{6}$

3. For each of the following, simplify completely. Remember, when multiplying, you can multiply the outsides together and multiply the insides together before breaking down.

a. $\sqrt{18} \cdot \sqrt{6}$ b. $3\sqrt{5} \cdot 2\sqrt{10}$

4. What must be true about a for the statement $\sqrt{7a} \cdot \sqrt{36} = 7 \cdot 6 = 42$ to be true?

5. Evaluate the following:

a. $\frac{1}{3} \cdot \frac{3}{7} \cdot \frac{8}{2}$ b. $\frac{2}{5} + \frac{4}{5}$ c. $\frac{2}{3} - \frac{7}{4}$

Section 2. Algebraic Foundations

1. Write the equation, in slope-intercept form (if possible), of the line described by each:

a. goes through $(-2,-8)$, slope = $\frac{3}{5}$

b. goes through $(1,5)$ and $(3,9)$

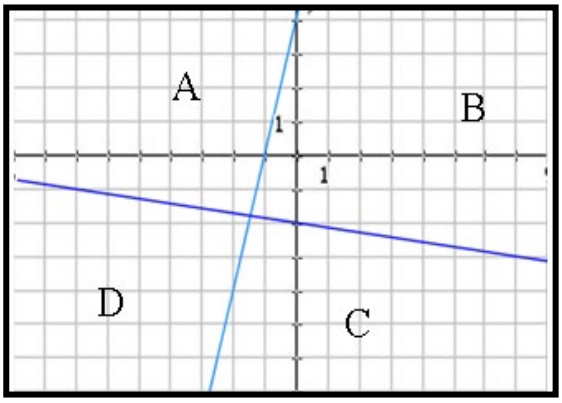
c. vertical, through (1, 4)

d. horizontal, through (8, 2)

2. Find the equation of the linear function that is parallel to $2x-3y=6$ and passing through the point $(0,3)$.

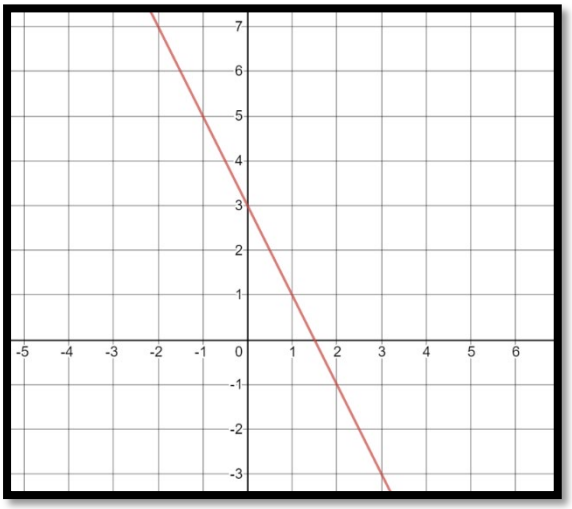
3. Which region (A,B,C, or D) would be shaded to represent the correct solution to the system of linear inequalities

$$\begin{cases} 7y+x \le -14 \\ 4x-y \le -4 \end{cases}$$



Section 3. Functions and Relations

1. Given the graph of $f(x) = -2x + 3$, evaluate the function at the following:



a. $f(1) =$ b. $f(-2) =$

c. $f(2) =$ d. $f(0) =$

2. Use the graph to identify the following key features:

a. Identify the x-intercept:_____

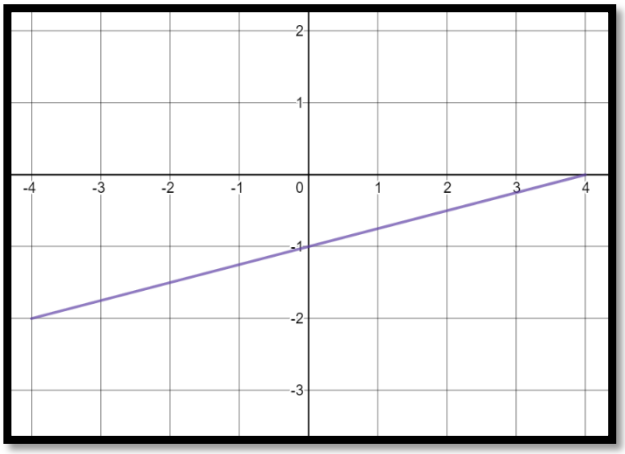
b. Identify the y-intercept:_____

c. Identify the rate of change:_____

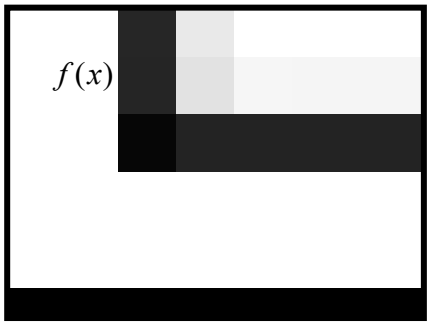
d. Identify the domain:_____

e. Identify the range:_____

f. Is the function increasing or decreasing?



3. Answer the following questions for the graph of $f(x)$ and $g(x)$ to the below:



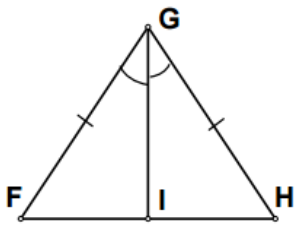


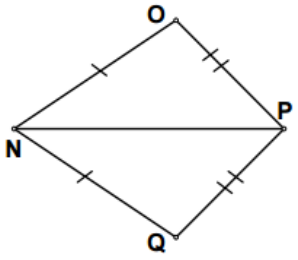
a. $f(2) =$ b. $g(3) =$ c. $g(-3) =$ d. $f(0) =$

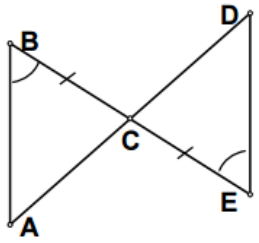
Section 4. Geometry Connections

1. If a right triangle has legs of 4in and 5in, use the Pythagorean Theorem to find the exact length of the hypotenuse.

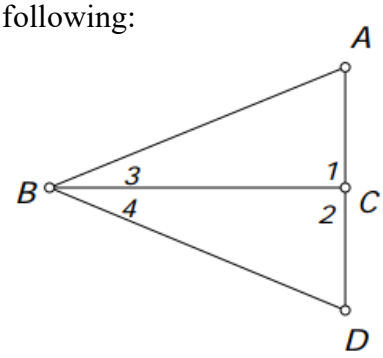
2. In each of the figures below, write a congruence statement for the figures AND the postulate that proves that the triangles are congruent.

a. 

b. 

c. 

3. Use the following diagram to make conjectures when given the following:



a. If $BC \perp AD$, then _____.

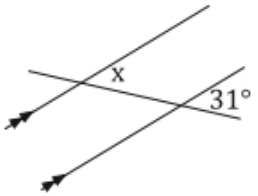
b. If $\overrightarrow{BC}$ bisects $\angle ABD$, then _____.

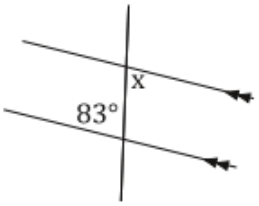
c. If C is the midpoint of $\overline{AD}$, then _____.

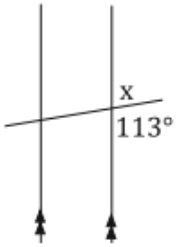
4. In a triangle, one angle measures 46° while another measures 108°. What is the measure of the remaining angle?

5. Find the equation of the perpendicular bisector of $\overline{PQ}$ for the given endpoints: $P(5,2), Q(7,4)$

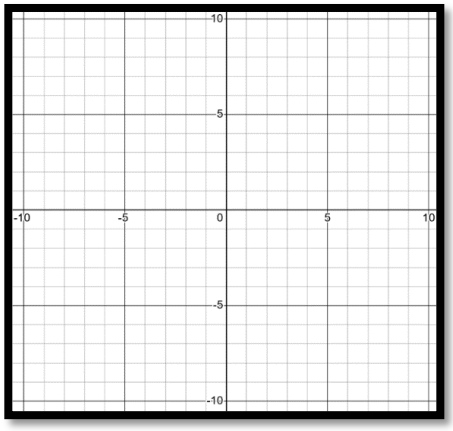
6. Solve for x in each figure below:

a. 

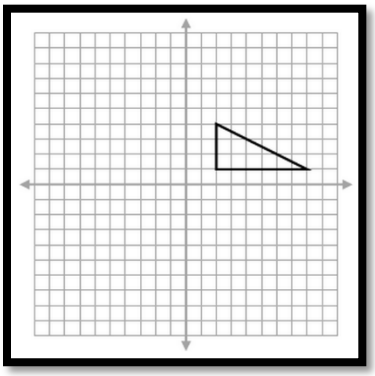
b. 

c. 

7. Use the Pythagorean Theorem or Distance Formula to determine the length of AB, given A = (-2,7) and B = (10, 2)



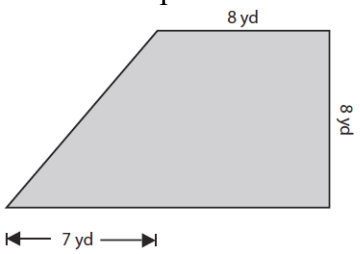
8. Draw a reflection of the figure shown over the x-axis.



9. Find the length of one side of a square whose perimeter is 52 feet.

10. The perimeter of a rectangle is 66. The length is twice the width. Find the length and width of the rectangle.

11. Find the perimeter of the shape shown below.



Section 5. Statistics and Probability

1. Angela asked 100 adults which type of music they enjoyed. They could choose Jazz, Rock, Classical or Folk music. The two-way table shows some information about their answers.

	Jazz	Rock	Classical	Folk	Total
Men	12		19	4	52
Women		23			
Total	21			11	100

a. Complete the two-way table.

b. How many did not choose Classical music?

2. A bag contains 45 dyed eggs: 15 yellow, 12 green and 18 red. What is the probability of selecting a green or a red egg?

3. A pair of dice is rolled. What is the probability that the sum is less than 4?

4. Using theoretical probability of tossing a head when flipping a coin, how many times would you expect to get a head if you flipped the coin 200 times?

Section 6. Problem Solving Practice and Application

1. Find three consecutive integers such that three times the first, added to the third, is 102.

2. Scott has a board 7 yards long. He wants to cut it to make shelves 5 feet long. How many shelves can he make?

3. Sandra bicycled from her home to school at 8mph. She returned home at 4mph. If the round trip took 3 hours, how many miles is it from school to Sandra's house.

4. A jet ski uses a mixture of gasoline and oil. For each ounce of oil, the mixture contains 16ounces of gasoline. If the tank holds 68 ounces of gasoline, how mnay ounces of oil does it require.

5. A woman put $580 into a savings account for one year. The rate of interest on the account was 6½%. How much was the interest for the year in dollars and cents? (Round to the nearest cent)