

Summer Work Packet for MPH Math Classes

**Students going into ALGEBRA I
Sept. 2020**

Name: _____

This packet is designed to help students stay current with their math skills. Each math class expects a certain level of number sense, algebra sense, and graph sense in order to be successful in the course.

These problems need to be completed in the space provided. Be sure to show all work.

Students should complete this by September 11th and expect a quiz/test on the material in the first quarter. If you have any questions, please email Mr. Ochs at jochs@mphschool.org or Mrs. Meehan at dmeehan@mphschool.org.

****You will need a TI-84⁺ calculator for this class.****

Rules with negative numbers

For questions 1-4, fill in the blank with either positive or negative.

1. A negative number times a negative number is a _____ number.
2. A negative number times a positive number is a _____ number.
3. A positive number divided by a negative number is a _____ number.
4. A negative number divided by a negative number is a _____ number.

Adding Fractions: Remember that you must have a common denominator to add fractions. You can work the problems across (horizontally) or up and down (vertically).

Example (horizontally): $\frac{3}{4} + \frac{5}{6} = \frac{9}{12} + \frac{10}{12} = \frac{19}{12} = 1 \frac{7}{12}$

5. $\frac{2}{9} + \frac{1}{6}$

7. $3 \frac{3}{8} + 8 \frac{3}{32}$

6. $\frac{3}{4} + \frac{4}{7}$

8. $2 \frac{7}{10} + 6 \frac{4}{15}$

Subtracting Fractions: Remember that you must have a common denominator to subtract fractions. You can work the problems across (horizontally) or up and down (vertically).

Example: $\frac{3}{4} - \frac{5}{8} = \frac{6}{8} - \frac{5}{8} = \frac{1}{8}$

9. $\frac{2}{9} - \frac{1}{6}$

11. $2\frac{3}{4} - \frac{4}{9}$

10. $\frac{7}{12} - \frac{5}{9}$

12. $6\frac{3}{10} - 5\frac{3}{8}$

Multiplying fractions: When you are multiplying fractions, you do not need to find a common denominator. You must first change any whole number or mixed number to an improper fraction. Remember, when you are multiplying fractions it is easier to simplify first, if possible, and then multiply the numerators and multiply the denominators.

EXAMPLE: $\frac{24}{25} \times \frac{15}{28} = \frac{6}{5} \times \frac{3}{7} = \frac{18}{35}$

EXAMPLE: $4\frac{2}{3} \times 15 = \frac{14}{3} \times \frac{15}{1} = 14 \times 5 = 70$

13. $6\frac{3}{4} \times -\frac{2}{9} =$

15. $-2\frac{2}{27} \times 3\frac{3}{8} =$

14. $18 \times \frac{4}{27} =$

16. $-\frac{42}{35} \times -\frac{10}{21} =$

Dividing fractions: The rule for dividing fractions and mixed numbers is to first convert each number to a fraction (proper or improper). Then keep the first number the same, change the problem to multiplication and use the reciprocal of the second fraction. Now you can follow the rules for multiplication.

EXAMPLE: $3\frac{3}{5} \div 2\frac{4}{7} = \frac{18}{5} \div \frac{18}{7} = \frac{18}{5} \times \frac{7}{18} = \frac{7}{5} = 1\frac{2}{5}$

17. $-\frac{27}{4} \div -\frac{18}{5} =$

19. $6\frac{3}{4} \div \frac{45}{8} =$

18. $18 \div \frac{54}{7} =$

20. $-8\frac{3}{10} \div 7\frac{1}{15} =$

Order of Operations: Find the answer and show your work. Remember: Grouping symbols, Exponents, Multiplication and Division, then Addition and Subtraction, all from left to right.

21. $9(3 \div 3) + 4(-5 \times 9) \div 3$

23. $\frac{8 - 13}{(4 + 9) + 4}$

22. $12 \div [(8 \div 2^2)(3^2 \div 3)]$

24. $\frac{3^2 - 5 \cdot 7 - 4^2}{(-4 - 9 - 12) + 4}$

Solve for the variable. Show your work.

$$25. \quad \frac{p}{7} = 10$$

$$27. \quad -6 = \frac{3u}{4} + 12$$

$$26. \quad 5(j-4) + j = -8$$

$$28. \quad \frac{5}{2}x + 3 = \frac{1}{2}x + 15$$

Write the sentence as an algebraic equation and then solve it. Identify your variable.

29. **Twice** a number, **increased** by **three times** the number, *is equal to* **4 times** the **sum** of the number and 3. Find the number.

30. If the **difference** of **three times** a number and 15 is **divided** by 12, the result *is equal to* the **difference** between 5 and the number. Find the number.

Write each inequality in algebraic form.

31. Six times a number is less than or equal to fourteen.

32. One fifth of a number is no less than eight.

33. Negative five times a number at least twenty.

Solve the inequality. Graph your answer on a number line. The domain is the set of all Real Numbers. Remember, if you multiply or divide by a negative number you must switch the direction of the inequality sign.

34. $-3t + 6 \leq -3$

35. $-5 - 8f > 59$



Combine like terms. Example: $3(m + n) - 2(3m - 4n) = 3m + 3n - 6m + 8n = -3m + 11n$

36. $3x + 4y - 4x + 3y - z$

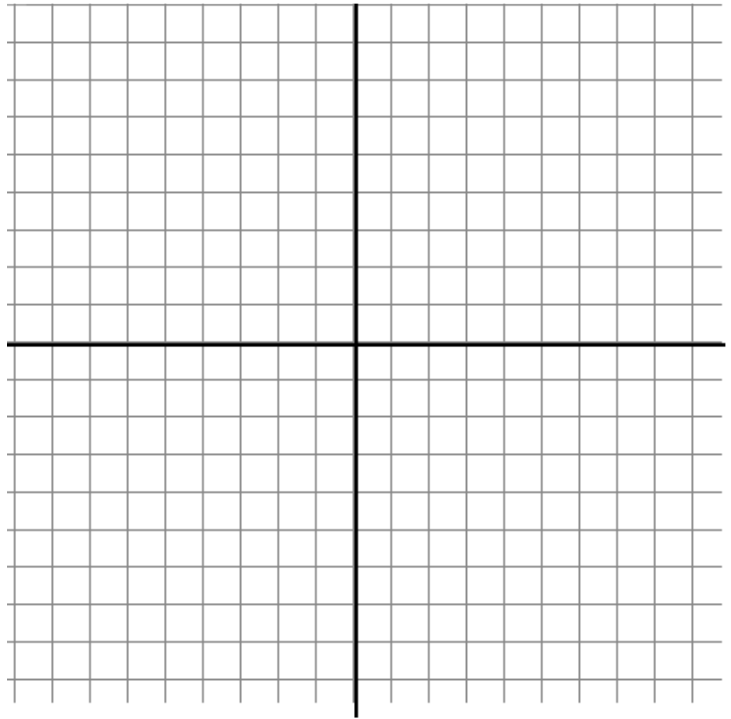
38. $-5x - (x - y)$

37. $-3(m - n) + 4n - 5m$

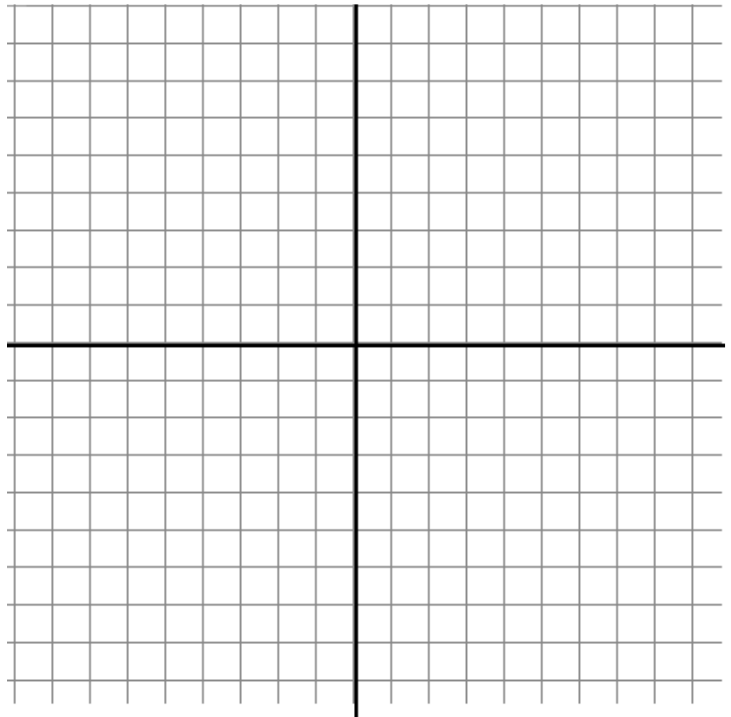
39. $3(x - 7y) - 9(y - 3y) + 4(x - 2y)$

Graph the following equations. Label 3 points on the line.

40. $y = 5x - 3$



41. $y = -x + 3$



42. Write the equation $y - 4 = 3(x - 1)$ in **slope-intercept form** ($y = mx + b$).
Give the **slope** and the **coordinates** of the **x and y intercepts**. Draw the graph.

Slope-intercept form: _____

Slope: _____

x-intercept: _____

y-intercept: _____

