

Summer Work Packet for MPH Math Classes

**Students going into
Geometry
Sept. 2018**

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, or on a separate sheet of paper, by the first day of class. Be sure to show all work.

Students can expect this packet to be graded, and/or to have a test on this material during the first marking period. If you have any questions, please email Mrs. Reeve at sreeve@mphschool.org or Mrs. Meehan at dmeehan@mphschool.org.

Supply List for Geometry

TI-84 or TI-84⁺ calculator

1/4" graph paper

Pencils/pens

Colored pencils

3 ring binder

3 ring binder pencil pouch

Protractor

Quality compass -- Compasses with a wheel between the arms are strongly preferred, as they prevent slippage, which is important for successful constructions.

Show all work! Do **NOT** round any answers. Write the answers as a **fraction** if the **decimal is repeating** or the **calculator does not show the whole decimal**.

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

1. $40 - \frac{20 - 3(5)}{5} + 3(2 - 6)^2 =$

2. If $a = 6$, $b = -2$, and $c = 8$; $\frac{2(a - c)}{b + 4} =$

Translate into algebra.

3. Five times a certain number is half a different number. _____

Simplify. Show all your work. Remember, you need an LCD to add or subtract fractions.

4. $\frac{7}{9} - \frac{4}{5} =$

5. $\frac{6}{5} + 2\frac{5}{8} =$

$$6. \frac{8}{9} \div \frac{2}{3}$$

$$7. \left(\frac{-5}{7}\right)\left(\frac{3}{10}\right) =$$

Simplify each expression.

$$8. \quad 7b - 6c - 3c =$$

$$9. \quad (n^6)(n^4) =$$

$$10. \quad \frac{c^{50}}{c^{40}} =$$

$$11. \quad \frac{12a^6}{4a}$$

Solve each equation. Show all your work and CHECK!

$$12. \quad 6x = -3 + 7$$

$$13. \quad 4h = -2(3h + 5)$$

Check:

Check:

14. $18 = -3y$

15. $\frac{x}{-5} = 8$

Check:

Check:

16. $\frac{2x-8}{2} = 5$

17. $6x - 9 = x + 11$

Check:

Check:

18. $-5(3 - x) = 3x + 1$

Check:

Solve each inequality and graph the solution on a number line. Show all your work.
Remember, if you multiply or divide by a negative number you must switch the direction of the inequality sign.

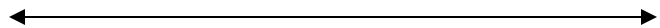
19. $x - (-4) > 9$



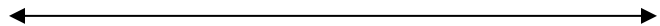
20. $\frac{x}{-2} < 3$



21. $9n + 3 < 3n - 15$

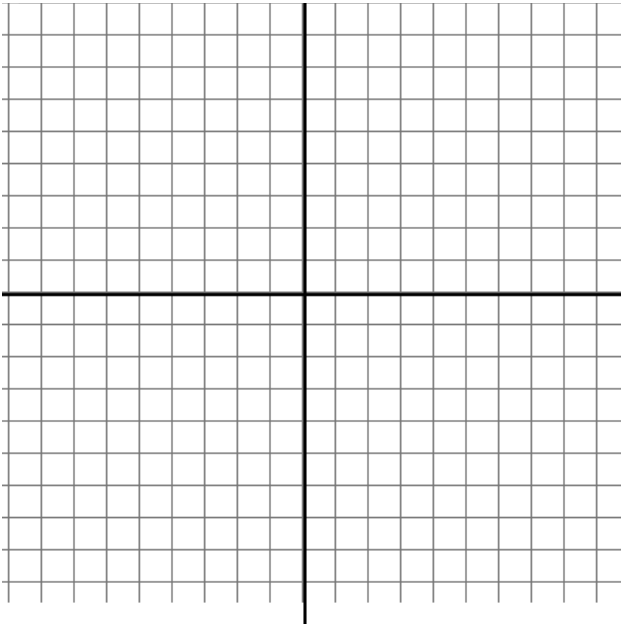


22. $3n + 5 \geq -4$



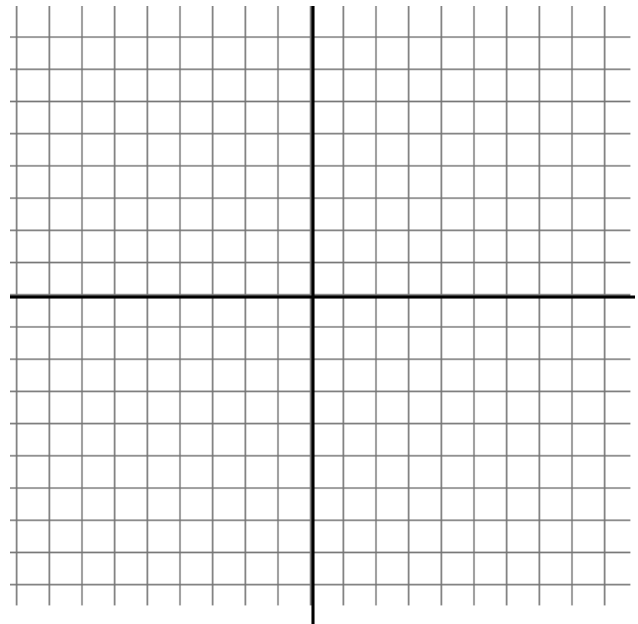
Graph the equation. Use a table or the slope-intercept method, $y = mx + b$.

23. $y = -2x + 3$ slope: _____ y-intercept: _____



Graph the inequality. Don't forget to shade and to show your check.

24. $y \leq 2x - 3$

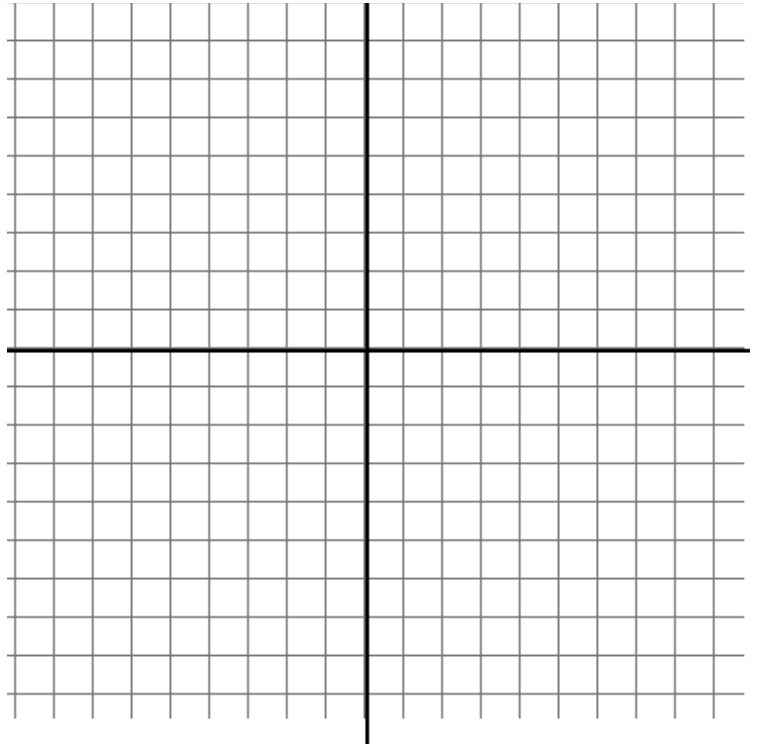


Find the slope of the line containing the points.

25. $(-3, 11)$ and $(2, 6)$

Find the x-intercept and y-intercept. Graph the points. Find the slope of the line through the points. Write the equation in slope-intercept ($y = mx + b$) form.

26. $6x - 4y = 12$



Simplify the following expressions.

Example: $3(m^2 + n) - 2(3m^2 - 4n) = 3m^2 + 3n - 6m^2 + 8n = -3m^2 + 11n$

27. $(3x^2 + 4x - 5xy) + (-7x^2 + 6x - 5xy)$

28. $(5y^3 - 3y + 4) + (2y^2 + 6y - 4y^3) - (9y^2 - 6 + 2y^3)$

29. $(-2x^7)(3x^4)$

30. $\frac{12x^3y^4z^5}{2x^5y^4z^2}$

Use the distributive property to expand the product. Follow the example.

EXAMPLE: $(x + 4)(2x - 11) = 2x^2 - 11x + 8x - 44 = 2x^2 - 3x - 44$

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

32. $(y - 8)(y + 8)$

33. $(2x + 5)(3x - 4)$

Factor each into the product of two binomials. Follow the example.

EXAMPLE: $x^2 + 6x - 7 = (x - 1)(x + 7)$

34. $x^2 - 10x + 24$

35. $x^2 - 81$

36. $x^2 - 8x - 20$

37. $x^2 + 13x + 36$

Factor each and solve for x. Follow the example.

EXAMPLE: $x^2 + 5x - 6 = 0$
 $(x + 6)(x - 1) = 0$
 $(x + 6) = 0$ OR $(x - 1) = 0$
 $x = -6$ OR $x = 1$

Factored and equal to 0
Either factor may equal 0

38. $x^2 + 6x + 8 = 0$

39. $x^2 - 3x - 4 = 0$

40. $x^2 - 15x + 50 = 0$

41. $x^2 + x - 12 = 0$

Solve by the graphing, substitution or elimination method.

EXAMPLE Substitution: $y = 3x - 4$ and $8x - 2y = 10$

$8x - 2(3x - 4) = 10$ **Substitute the value for y**

$8x - 6x + 8 = 10$

$2x + 8 = 10$

$2x = 2$

$x = 1$ **Finish solving: $y = 3(1) - 4$ so $y = -1$.**

Then CHECK! $8(1) - 2(-1) = 10$

$8 + 2 = 10$ **yes**

EXAMPLE Elimination: $4x + 6y = 12$

$\underline{4x - 8y = 5}$ **Subtract the two equations to get ----**

$14y = 7$

$y = \frac{1}{2}$ **Finish solving for x: $4x + 6(.5) = 12$, so $x = \frac{9}{4}$.**

Then CHECK! $4(\frac{9}{4}) - 8(\frac{1}{2}) = 5$

$9 - 4 = 5$ **yes**

42. $2y + x = 5$
 $y = 3x - 1$

Check:

43. $x = 3 + y$
 $x - 7y = 45$

Check:

44. $5x + 2y = 13$
 $5x + 4y = 11$

Check:

RULES FOR SIMPLIFYING RADICALS (square roots)

$$a\sqrt{b} \times c\sqrt{d} = ac\sqrt{bd} \qquad \frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}} \qquad \sqrt{a} \times \sqrt{a} = \sqrt{a^2} = |a|$$

$$a\sqrt{b} + c\sqrt{b} = (a + c)\sqrt{b}$$

Remember, proper form for radicals means:

a. No perfect square factor under the radical. For example, $\sqrt{45} = \sqrt{9 \times 5} = 3\sqrt{5}$.

b. No fractions/decimals may be left under the radical. For example, $\sqrt{\frac{3}{4}} = \frac{\sqrt{3}}{\sqrt{4}} = \frac{\sqrt{3}}{2}$.

c. No radical may be left in the denominator of a fraction. For example,

$$\sqrt{\frac{3}{7}} = \frac{\sqrt{3}}{\sqrt{7}} = \frac{\sqrt{3}}{\sqrt{7}} \times \frac{\sqrt{7}}{\sqrt{7}} = \frac{\sqrt{21}}{7}. \text{ Another example, } \frac{15\sqrt{75}}{20\sqrt{21}} = \frac{3\sqrt{25}\sqrt{3}}{4\sqrt{7}\sqrt{3}} = \frac{3 \times 5}{4\sqrt{7}} = \frac{3 \times 5 \times \sqrt{7}}{4\sqrt{7}\sqrt{7}} = \frac{15\sqrt{7}}{28}.$$

Simplify each. Leave in best radical form. NO DECIMAL EQUIVALENTS.

45. $\sqrt{32}$

46. $\frac{\sqrt{64}}{\sqrt{16}}$

47. $\sqrt{20} - \sqrt{80}$

48. $4\sqrt{5} \times 3\sqrt{10}$

49. $\frac{\sqrt{18}}{\sqrt{24}}$

50. $\frac{8\sqrt{3}}{\sqrt{2}}$

Write an equation and solve. Example: What is 24% of 70? $x = .24 \times 70$, $x = 16.8$

51. What is 30% of 210?

52. 18 is what percent of 45?

53. 16.8 is 28% of what number?

Enjoy your summer. See you in the Fall!