# Summer Work Packet for MPH Math Classes

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

**If you have any questions, please email Mrs. Reeve at sreeve@mphschool.org**

## Supply List for Geometry

- TI-84$^{+}$ calculator (Please bring in the points off the packaging, if you buy a new one.)
- Pencils/pens
- Colored pencils
- 3 ring binder (Can be shared with another class)
- 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 <u>show your work</u>. Remember Order of Operations: G**rouping, **E**xponents, **M**ultiplication and **D**ivision, then **A**ddition and **S**ubtraction, 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. <u>Show all your work</u>. 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. $7b - 6c - 3c =$

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

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

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

**Solve each equation. <u>Show all your work</u> and CHECK!**

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

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

Check:

Check:

14. $18 = -3y$

Check:

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

Check:

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

Check:

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

Check:

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

Check:

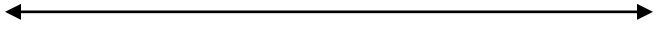
**Solve each inequality and graph the solution on a number line. Show all your work.**
**Remember, if you multiply or divide by a negative number you must switch the direction of the inequality sign.**

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

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

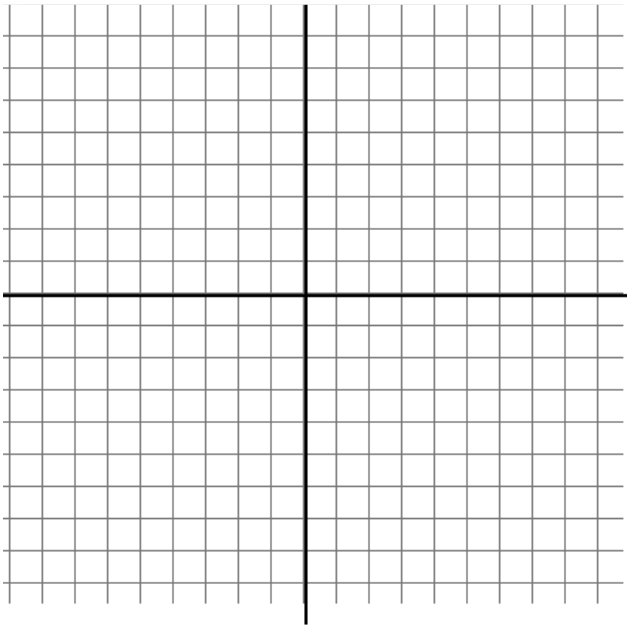
21. $9n + 3 < 3n - 15$

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



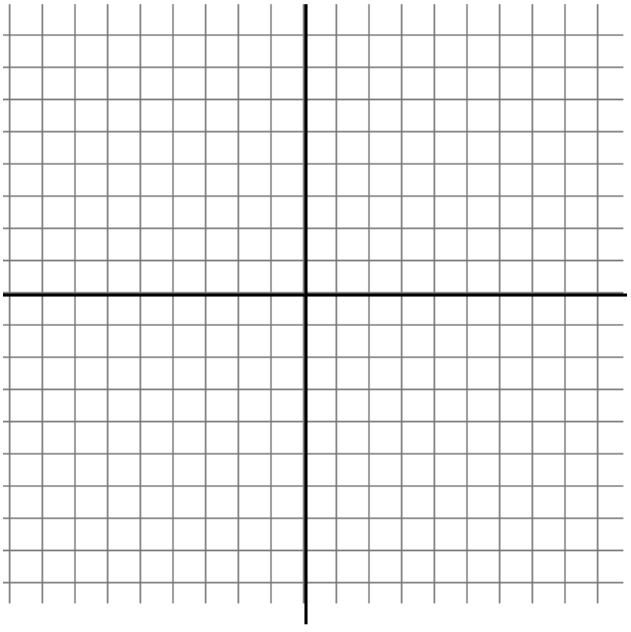
**Graph the equation. Use a table or the slope-intercept method, y = mx + b.**

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



**Graph the inequality. Don't forget to shade and to show your <u>check</u>.**

24. $y \leq 2x - 3$

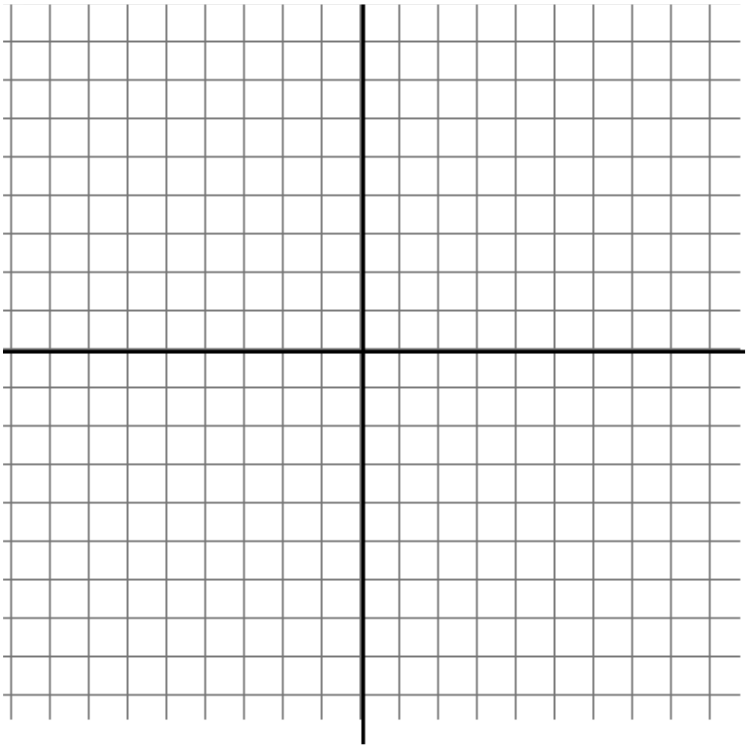


**Find the slope of the line containing the points.**

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

**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:** $x^2 + 5x - 6 = 0$

$(x + 6)(x - 1) = 0$ **Factored and equal to 0**

$(x + 6) = 0$ **OR** $(x - 1) = 0$ **Either factor may equal 0**

$x = -6$ **OR** $x = 1$

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:** $4x + 6y = 12$

$4x - 8y = 5$ **Subtract the two equations to get ----**

$14y = 7$

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

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

$9 - 4 = 5$ 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)

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

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

**Remember, proper form for radicals means:**

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

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

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

$\sqrt{3/7} = \frac{\sqrt{3}}{\sqrt{7}} = \frac{\sqrt{3}}{\sqrt{7}} \times \frac{\sqrt{7}}{\sqrt{7}} = \frac{\sqrt{21}}{7}$. 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. $\frac{8\sqrt{3}}{\sqrt{2}}$