Summer Work Packet for MPH Math Classes

Students going into
Geometry
Sept. 2017

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. Sheffield at csheffield@mphschool.org , or Mrs. Meehan at dmeehan@mphschool.org.

Supplies List for Geometry
TI-84 or TI-84^{+} calculator
a three ring binder
¼" graph paper
pencils, (mechanical pencil preferred)
3 ring binder
3 ring binder pencil pouch
protractor
quality compass

Recommended compass – order online:
Mars Bow compass – 551 40 WP Bow compass
(also available at Office Dealer for $12.46.)

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: Grouping, **E**xponents, **M**ultiplication and **D**ivision, then **A**ddition and **S**ubtraction, all from left to right.

1. $30 - \frac{20 - 3(5)}{5} + 4(2 - 6)^2 =$

2. If a = 5, b = – 2, and c = 2; $\frac{2(a - c)}{b + 4} =$

Translate into algebra.

3. Three 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. $6b - 2c - 3c =$

9. $(n^3)(n^4) =$

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

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

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

12. $8x = -3 + 7$

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

Check:

Check:

14. $18 = -2y$

Check:

15. $\frac{x}{-5} = 3$

Check:

16. $\frac{2x-8}{2} = 6$

Check:

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

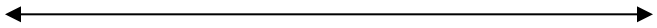
Check:

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

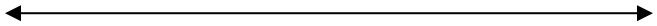
Check:

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.

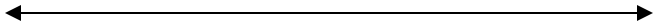
19. $x - (-4) > 6$



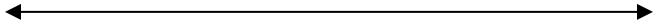
20. $\frac{x}{-2} < 7$



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

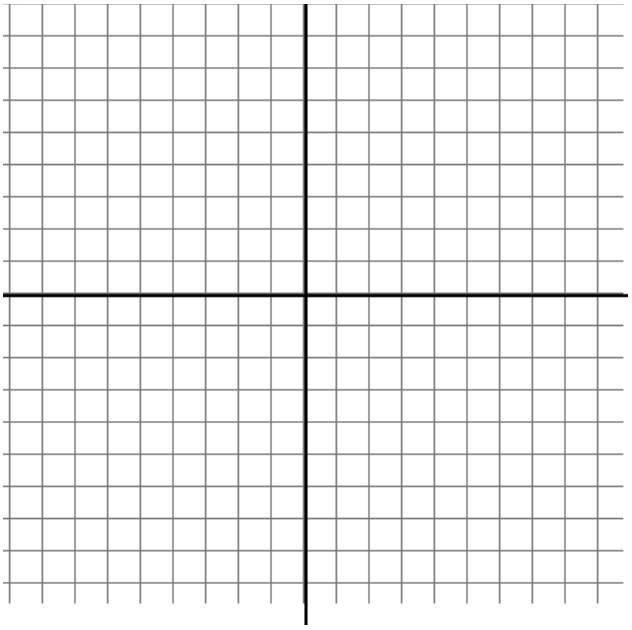


22. $3n + 5 \geq -1$



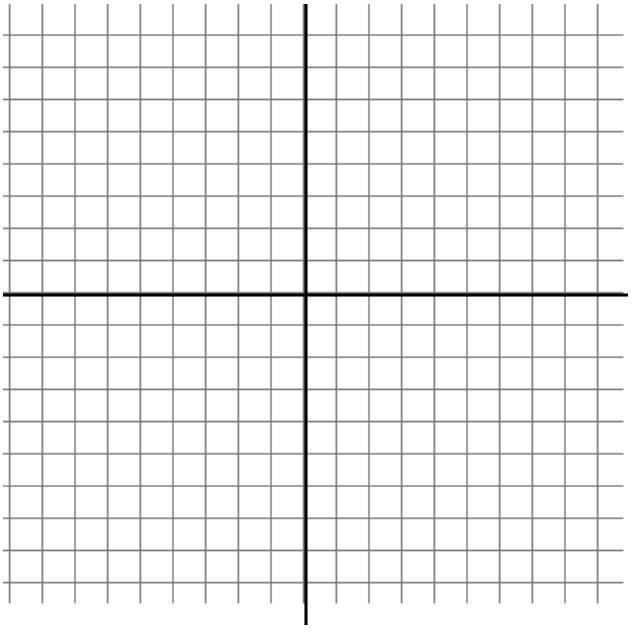
Graph the equation. Use a table or the slope-intercept method, y = mx + b.

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



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

24. $y \leq 2x - 1$

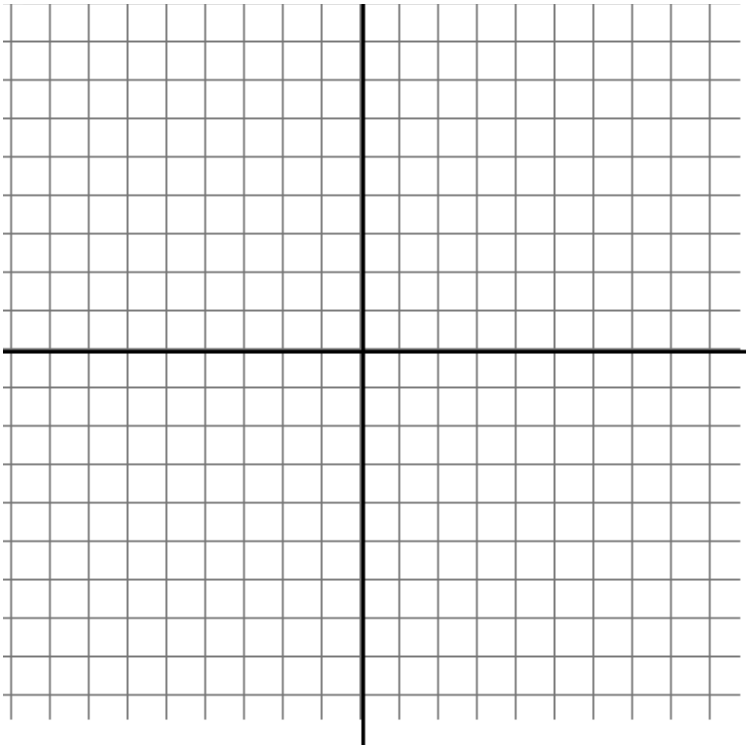


Find the slope of the line containing the points.

25. (–3, 11) and (2, 5)

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. 3x – 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. $(x – 8)(x + 3)$

32. $(y – 3)(y + 3)$

33. $(2x + 3)(5x – 6)$

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!

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

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

$14y = 7$

$y = .5$ **Finish solving for x: 4x + 6(.5) = 12, so x = 2.25.**

Then CHECK!

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

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

51. What is 30% of 160?

52. 18 is what percent of 45?

53. 16.8 is 28% of what number?

Enjoy your summer. See you in the Fall!