

# **Summer Work Packet for MPH Math Classes**

**Students going into  
Algebra II/Trig  
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 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](mailto:sreeve@mphschool.org) or Mrs. Meehan at [dmeehan@mphschool.org](mailto:dmeehan@mphschool.org).**

Name \_\_\_\_\_

**Solve each equation for the given variable. CHECK your answer.**

1.  $12x - 1 = 6x + 2$

2.  $4(3x - 2) = 12x - 8$

3.  $4z = 2(1 + 2z)$

4.  $\frac{x+5}{7} = \frac{5}{3}$

5.  $\frac{2x-1}{9} = \frac{x-2}{5}$

**Graph the following points on graph paper. Draw a line through the points.  
Find the slope of the line.  
Label the coordinates of the x-intercept and y-intercept.**

6. (5, 11) and (3, 7)

7. (-4, 8) and (-3, 4)

**Write the equation of the line with the given information.**

8.  $m = \frac{1}{2}$  and going through the point (0, -3)

9.  $m = 5$  and going through the point (-3, 4)

10.  $m = \frac{2}{3}$  and going through the point (9, -1)

**Graph the lines on graph paper. Find the slope and the y-intercept of each. Find the coordinates of the point of intersection. CHECK the point in both equations.**

11.  $y = 3x - 2$  and  $y = \frac{1}{2}x + 3$                       Intersection point: \_\_\_\_\_

slope: \_\_\_\_\_                      slope: \_\_\_\_\_                      CHECK:

y-int.: \_\_\_\_\_                      y-int.: \_\_\_\_\_

**RULES FOR SIMPLIFYING RADICALS (square roots)**

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

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

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

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

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,

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

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

$$12. \frac{\sqrt{49}}{\sqrt{25}}$$

$$16. \frac{3}{\sqrt{13}}$$

$$13. \sqrt{28}$$

$$17. \frac{2\sqrt{5}}{\sqrt{81}}$$

$$14. 4\sqrt{75}$$

$$18. \sqrt{48} + \sqrt{27}$$

$$15. 7\sqrt{30} \cdot 2\sqrt{6}$$

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

**EXAMPLE:**  $(x + 4)(x - 11) = x^2 - 11x + 4x - 44 = x^2 - 7x - 44$

19.  $(x + 1)(x + 4)$

20.  $(x - 3)(x - 6)$

21.  $(x - 7)(x + 9)$

22.  $(x + 5)(x - 4)$

23.  $(3x - 1)(3x + 1)$

24.  $(2x + 5)(x - 8)$

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

**EXAMPLE:**  $3x^2 + 7x - 6 = (3x - 2)(x + 3)$

25.  $x^2 + 4x + 3$

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

26.  $k^2 + 6k + 9$

30.  $x^2 + 11x + 24$

27.  $x^2 - 12x + 36$

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

28.  $t^2 - 25$

**Factor each and solve for x. Follow the example.**

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

$$(x + 6)(x - 1) = 0$$

$$(x + 6) = 0 \text{ OR } (x - 1) = 0$$

$$x = -6 \quad \text{OR} \quad x = 1$$

**Factored and equal to 0**

**One of the factors must equal 0**

**Solve for x**

32.  $x^2 + 3x - 18 = 0$

35.  $x^2 + 25x + 24 = 0$

33.  $x^2 - 7x + 10 = 0$

36.  $2x^2 - x - 10 = 0$

34.  $x^2 - 25 = 0$

37.  $x^2 + 25 = 10x$



**Simplify the following polynomials by combining like terms:**

38.  $2(x - 5) + (5x + 2) + (8x + 1)$

39.  $(x - 10) + 4(x + 7) - 2(x + 3)$

40.  $(3y^2 - 8) + (5y + 9) - (y^2 + 6y - 4)$

41.  $(9x^3 + 3x - 13) - (6x^2 - 5x) + (2x^3 - x^2 - 8x + 4)$

Draw and label a picture, then write an equation to solve the problems.

42. Two angles are supplementary. If the second angle is  $30^\circ$  more than twice the first angle, find the measure of each angle.

43. The lengths of the sides of parallelogram ABCD are  $AB = 2x + 5$ ,  $BC = 5x - 4$  and  $CD = 6x - 7$ . Find the value of  $x$ . What type of special parallelogram is ABCD?

44. The legs of a right triangle measure 16 and 30. Find the length of the hypotenuse.

45. In  $\triangle ABC$ ,  $\angle A = 3x - 20$ ,  $\angle B = 6x + 15$  and  $\angle C = x - 5$ . Find the measure of the three angles.