

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

**Students going into  
Functions  
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. Be sure to show all work.**

**Students can expect this packet to be graded and handed in on the first day of school. If you have any questions, please email Ms. Guerra at [dguerra@mphschool.org](mailto:dguerra@mphschool.org) or Mrs. Meehan at [dmeehan@mphschool.org](mailto:dmeehan@mphschool.org).**

**You will need a TI-84 or TI-84<sup>+</sup> calculator for this class.**

**Show all work on the packet!! 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**.

I. Simplify completely (no negative exponents).

$$\frac{(4x^2)^{-2} y^2 z^4}{x^3 (yz)^{-3}}$$

$$\frac{(c)^{\frac{3}{5}} (2d)^{-2}}{c^{\frac{1}{5}} (2d)^3}$$

$$\sqrt[3]{24x^9 y^6 z^2}$$

$$\sqrt{250} + \sqrt{160}$$

II. Factor using the grouping method or the sum of two cubes.

$$x^2y - 2z^2 - 2xyz + xz$$

$$64x^3 + 27$$

III. Simplify completely:  $\frac{\frac{5}{2} + \frac{4}{x}}{1 + \frac{3}{4x}}$

IV. Factor each expression and cancel to simplify:

$$\frac{(3y^2 - 108)(y^3 + 2y^2 - 24y)}{y(y^2 + 12y + 36)(3y^2 - 30y + 72)}$$

V. Combine using addition and/or subtraction. Be sure to find the LCD.

$$\frac{5}{6x} + \frac{3}{4y}$$

$$\frac{x}{x+2} - \frac{1}{x^2-4}$$

VI. Solve for x by factoring. Check your answers.

$$x^2 + 7x - 8 = 0$$

$$3x^3 - 7x^2 + 4x = 0$$

VII. Solve. Use factor by grouping.

$$2x^3 + x^2 - 8x - 4 = 0$$

VIII. Solve by multiplying by the LCD. Check your answers.

$$\frac{5}{x} + \frac{1}{2} = -2$$

$$\frac{x}{x-3} + \frac{x^2}{x^2-7x+12} = \frac{2x+1}{x-4}$$

IX. Solve each system of equations using the substitution or elimination method. Check your answers.

$$x - y = 10$$

$$x + y = 22$$

$$x + 2y = 9$$

$$3x + 5y = 15$$

Check:

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X. Find an equation of a line that is determined by the following information:

Passes through the points  $(6, 3)$  and  $(2, -7)$

Perpendicular to the line  $3x + 2y = 5$  and goes through the point  $(5, -2)$

XI. Find all the solutions to the following equations and check your answers:

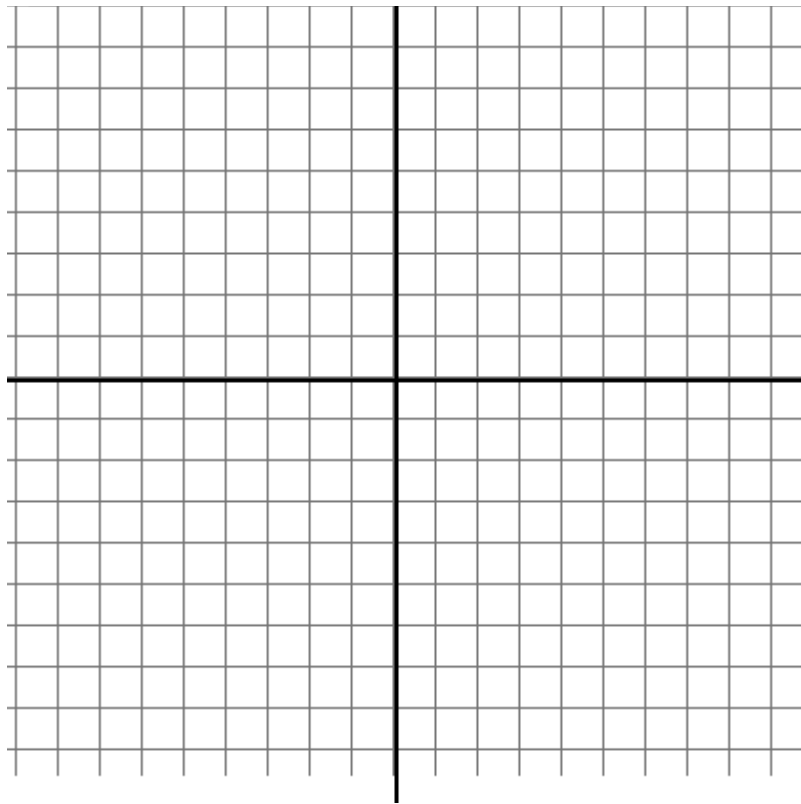
$$x^4 - 10x^2 + 24 = 0$$

$$\sqrt{x-1} = 2-x$$

XII. Change the following quadratic equation into vertex form by completing the square.

$$x^2 - 2x - 4 = 0$$

Now graph the answer above along with the equation  $y = x^2$  on the same graph. Then answer the questions below.



a. What is the domain of both functions? \_\_\_\_\_

b. What is the range of both functions? \_\_\_\_\_

c. What is the vertex of each function? \_\_\_\_\_

d. How did  $y = x^2$  become the equation you found by completing the square? Look at the movement of the vertex. \_\_\_\_\_