

Summer Work Packet for MPH Math Classes

**Students going into ALGEBRA I
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 on a separate sheet of paper (unless space has been provided) 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.

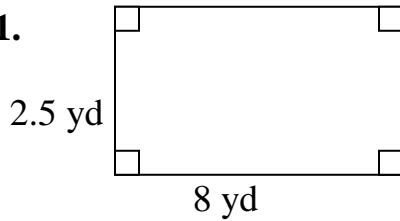
If you have any questions please email Mr. Ochs at jochs@mphschool.org or Mrs. Meehan at dmeehan@mphschool.org.

****You will need a TI-84⁺ calculator for this class.****

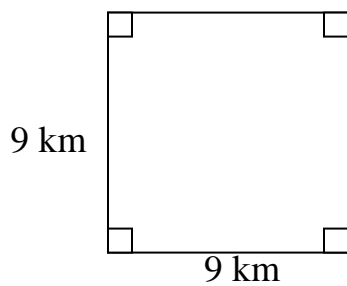
A) Find the AREA of each shape. Show your work. Be sure to use the units in your answer.

B) Find the PERIMETER or CIRCUMFERENCE of each shape. Show your work. Be sure to use the units in your answer.

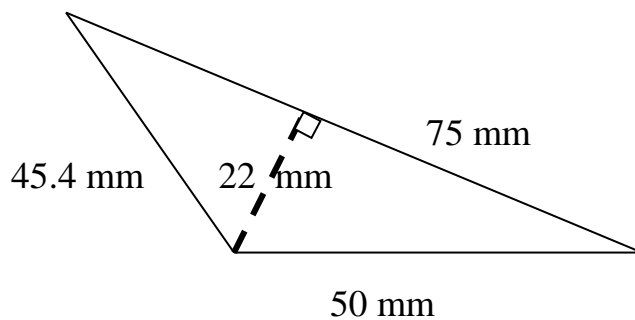
1.



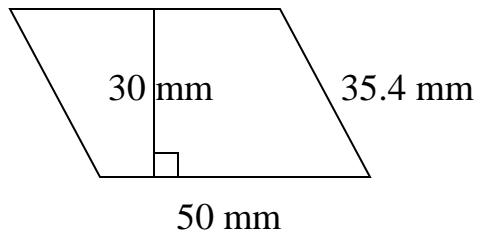
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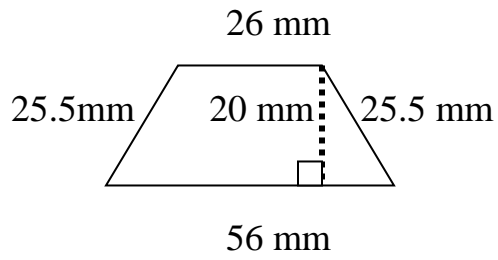
3.



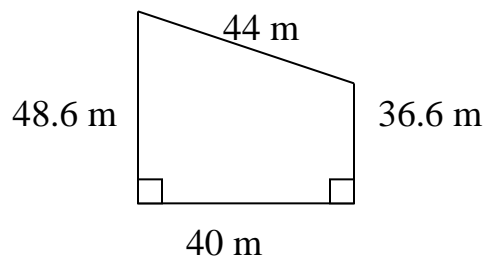
4. Parallelogram



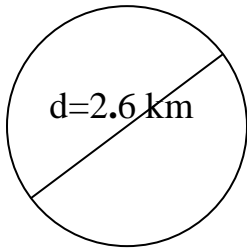
5.



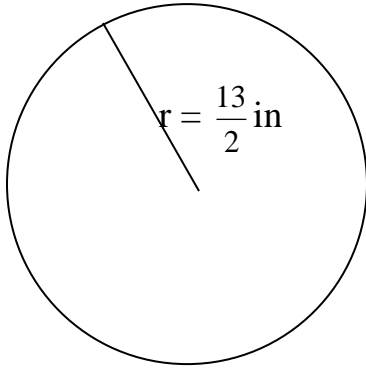
6.



7.



8.



9. The earth's circumference at the equator is 24,901.55 miles and the earth's circumference between the north and south poles is 24,859.82 miles. What is the difference in length of the **radii**? Round your answer to the nearest tenth.

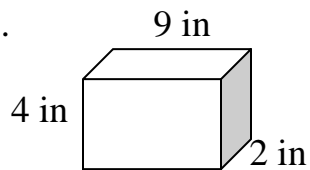


10. The tire of a bicycle has a diameter of 28 inches. How many revolutions will the wheel make if you ride it 9 miles? (12 inches = 1 foot and 5280 feet = 1 mile) Round your answer to the nearest tenth.

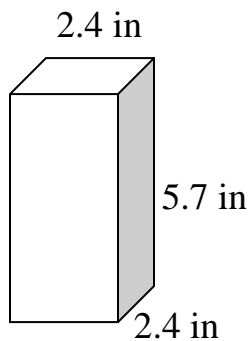


Find the VOLUME and SURFACE AREA of each shape. Show your work. Be sure to use the units in your answer.

11.



12.



13. The dimensions of the aquarium are given as: length = 48 inches, height = 24 inches, width = 15 inches. Find the **volume**.



14. One gallon of water takes up 231 cubic inches of space. How many gallons are in the aquarium above?

Adding Fractions: Remember that you must have a common denominator to add fractions. You can work the problems across (horizontally) or up and down (vertically).

Example 1 (horizontally):

$$\frac{3}{4} + \frac{5}{6} =$$

$$\frac{9}{12} + \frac{10}{12} =$$

$$\frac{19}{12} = 1\frac{7}{12}$$

Example 2 (vertically):

$$\frac{2}{3} = \frac{4}{6}$$

$$+ \frac{1}{2} = \frac{3}{6}$$

$$\frac{7}{6} = 1\frac{1}{6}$$

15.

$$\frac{2}{9}$$

$$+ \frac{1}{6}$$

16.

$$\frac{3}{4}$$

$$+ \frac{4}{7}$$

$$17. \quad 3 \frac{3}{8}$$

$$+ 8 \frac{3}{32}$$

$$18. \quad 2 \frac{7}{10}$$

$$+ 6 \frac{4}{15}$$

Subtracting Fractions: Remember that you must have a common denominator to subtract fractions. You can work the problems across (horizontally) or up and down (vertically).

Example 1: $\frac{3}{4} - \frac{5}{8} =$

$$\frac{6}{8} - \frac{5}{8} = \frac{1}{8}$$

Example 2: $\frac{2}{3} = \frac{10}{15}$

$$- \frac{1}{5} = \frac{3}{15}$$

$$\frac{7}{15}$$

$$19. \quad \frac{2}{9}$$

$$- \frac{1}{6}$$

$$21. \quad 2 \frac{3}{4}$$

$$- \frac{4}{9}$$

$$20. \quad \frac{7}{12}$$

$$- \frac{5}{9}$$

$$22. \quad 6 \frac{3}{10}$$

$$- 5 \frac{3}{8}$$

Multiplying fractions: When you are multiplying fractions, you do not need to find a common denominator. You must first change any whole number or mixed number to an improper fraction. Remember, when you are multiplying fractions it is easier to simplify first, if possible, and then multiply the numerators and multiply the denominators.

EXAMPLE: $\frac{24}{25} \times \frac{15}{28} = \frac{6}{5} \times \frac{3}{7} = \frac{18}{35}$

EXAMPLE: $4\frac{2}{3} \times 15 = \frac{14}{3} \times \frac{15}{1} = 14 \times 5 = 70$

23. $6\frac{3}{4} \times -\frac{2}{9} =$

25. $18 \times \frac{4}{27} =$

24. $-2\frac{2}{27} \times 3\frac{3}{8} =$

26. $-\frac{42}{35} \times -\frac{10}{21} =$

Dividing fractions: The rule for dividing fractions and mixed numbers is to first convert each number to a fraction (proper or improper). Then keep the first number the same, change the problem to multiplication and use the reciprocal of the second fraction. Now you can follow the rules for multiplication.

EXAMPLE: $3\frac{3}{5} \div 2\frac{4}{7} = \frac{18}{5} \div \frac{18}{7} = \frac{18}{5} \times \frac{7}{18} = \frac{7}{5} = 1\frac{2}{5}$

27. $-\frac{27}{4} \div -\frac{18}{5} =$

28. $6\frac{3}{4} \div \frac{45}{8} =$

$$29. 18 \div \frac{54}{7} =$$

$$30. -8\frac{3}{10} \div 7\frac{1}{15} =$$

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

$$31. 9(3 \div 3) + 4(-5 \times 9) \div 3$$

$$33. \frac{8 - 13}{(4 + 9) + 4}$$

$$32. 12 \div [(8 \div 2^2)(3^2 \div 3)]$$

$$34. \frac{3^2 - 5 \cdot 7 - 4^2}{(-4 - 9 - 12) + 4}$$

Solve for the variable. Show your work.

$$35. \frac{p}{7} = 10$$

$$37. -6 = \frac{3u}{4} + 12$$

$$36. 5(j - 4) + j = -8$$

$$38. \frac{5}{2}x + 3 = \frac{1}{2}x + 15$$

Write the sentence as an algebraic equation and then solve it. Identify your variable.

39. **Twice** a number, **increased** by **three times** the number, *is equal to* **4 times** the **sum** of the number and 3. Find the number.

40. If the **difference** of **three times** a number and 15 is **divided** by 12, the result *is equal to* the **difference** between 5 and the number. Find the number.

Write each inequality in algebraic form.

41. Six times a number is less than or equal to fourteen.

42. One fifth of a number is no less than eight.

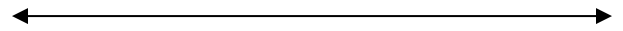
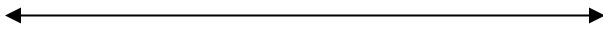
43. Five times a number is greater than eleven.

44. Negative five times a number at least twenty.

Solve the inequality. Graph your answer on a number line. The domain is the set of all Real Numbers. Remember, if you multiply or divide by a negative number you must switch the direction of the inequality sign.

$$45. \frac{-a}{11} > 9$$

$$47. -5 - 8f > 59$$



$$46. -3t + 6 \leq -3$$

$$48. -2 - \frac{d}{5} < 23$$



Combine like terms. Example: $3(m + n) - 2(3m - 4n) = 3m + 3n - 6m + 8n = -3m + 11n$

$$49. 3x + 4y - 4x + 3y - z$$

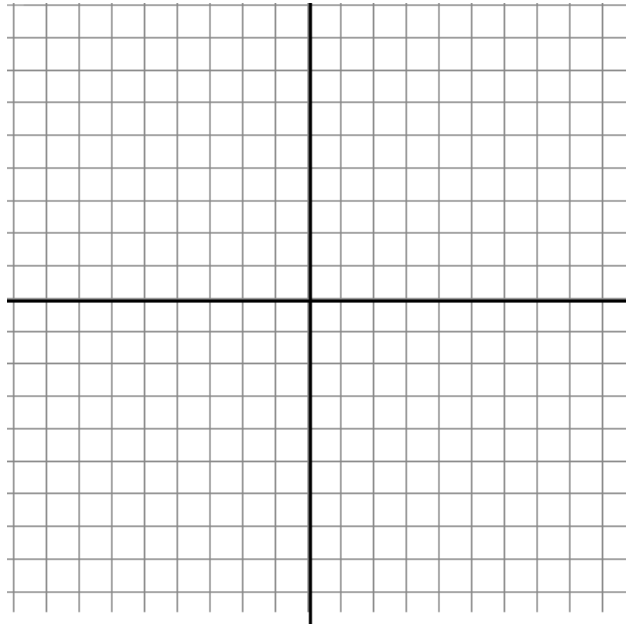
$$51. -5x - (x - y)$$

$$50. -3(m - n) + 4n - 5m$$

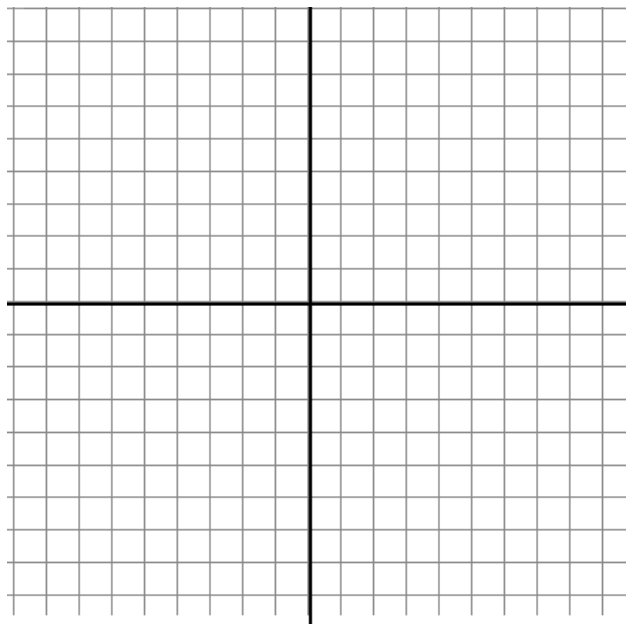
$$52. 3(x - 7y) - 9(y - 3y) + 4(x - 2y)$$

Graph the following equations. Label 3 points on the line.

53. $y = 5x - 3$



54. $y = -x + 3$



55. Write the equation $y - 4 = 3(x - 1)$ in **slope-intercept form** ($y = mx + b$).
Give the **slope** and the **coordinates** of the **x and y intercepts**. Draw the graph.

Slope-intercept form: _____

Slope: _____

x-intercept: _____

y-intercept: _____

