Happy Summer All!!

I have found an optional but extremely beneficial tool for you to look at over the summer. If you struggle with math, you should look into Khan Academy and complete a few of the tasks. Please note: this is optional, but will help you immensely before the first day of school.

In math this year, you will be completing some assignments in Khan Academy. Khan Academy is a fantastic aid in helping you understand any topics you may struggle with; it will reinforce the skills taught in class.

Please click the link(s) below and explore your grade level. You may also scan the QR codes and they will take you where you need to go.

PLEASE NOTE: Khan Academy is the optional resource, the completion of the math packet attached to this document is MANDATORY.
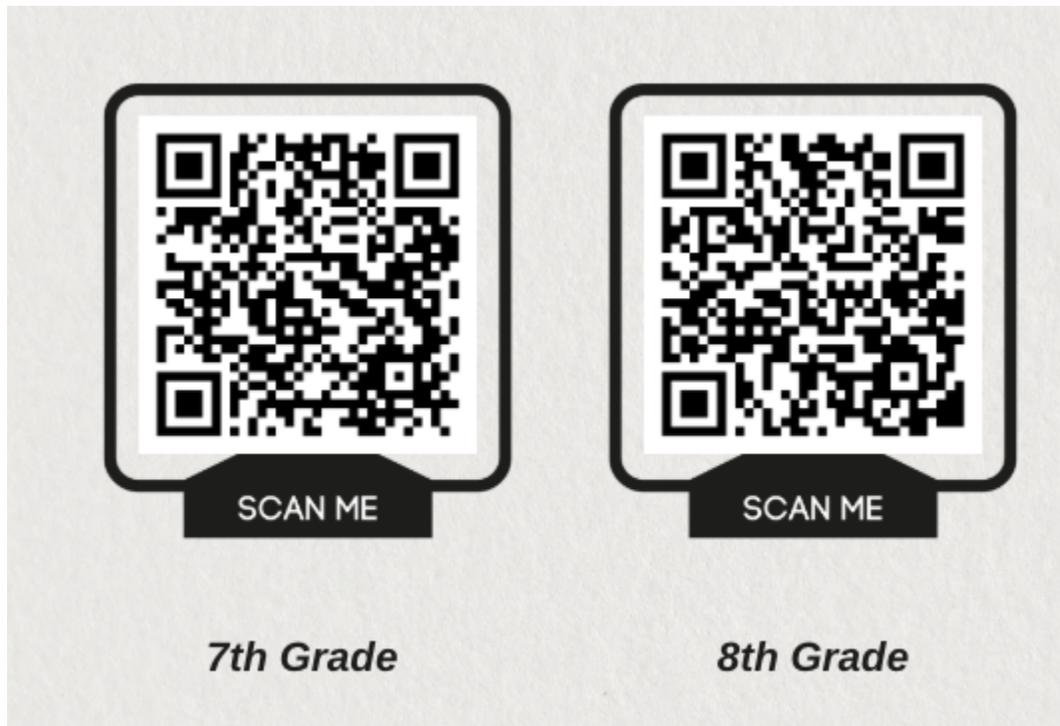
7th Grade:

7th Grade Math:
https://www.khanacademy.org/math/get-ready-for-7th-grade

8th Grade:

Algebra I: https://www.khanacademy.org/math/get-ready-for-algebra-i

Adding & Subtracting Decimals

1. Write the problem vertically, lining up the decimal points.

2. Add additional zeroes at the end, if necessary, to make the numbers have the same number of decimal places.

3. Add/subtract as if the numbers are whole numbers

4. Bring the decimal point straight down

ex: $14.2 - 7.934$

$$\begin{array}{r} 14.200 \\ -7.934 \\ \hline 6.266 \end{array}$$

Multiplying Decimals

1. Write the problem vertically with the numbers lined up to the right. The decimal points do NOT need to be lined up.

2. Ignore the decimals and multiply as if the numbers are whole numbers.

3. Count the total number of decimal places in the factors and put a decimal point in the product so that it has that same number of decimal places.

ex: 6.94×7.8

$$\begin{array}{r} 6.94 \\ \times 7.8 \\ \hline 5552 \\ +48580 \\ \hline 54132 \end{array}$$

6.94 → 2 decimal places
7.8 → 1 decimal place
+
3 decimal places

54.132

Dividing Decimals

1. Write the dividend under the long division symbol and the divisor to the left of it.

2. Move the decimal point in the divisor after the number to turn it into a whole number and then move the decimal in the dividend the same number of places. Then bring it up.

3. Divide as if the numbers are both whole numbers.

4. Annex zeros in the dividend as needed until there is no remainder. If your answer is a repeating decimal, write the answer using bar notation.

ex: $25.3 \div 0.3$

$$\begin{array}{r} 84.\overline{3} \\ 0.3\overline{)25.3\,0} \\ -24 \\ \hline 13 \\ -12 \\ \hline 10 \\ -9 \\ \hline 1 \end{array}$$

Order of Operations

1. Grouping Symbols (parentheses, brackets, etc.)

2. Exponents

3. Multiplication & Division (left to right)

4. Addition & Subtraction (left to right)

ex: $5 + 4(3 - 1.2)$

$5 + 4(1.8)$

$5 + 7.2$

12.2

Evaluate each expression.

1. $5.983 + 2.99$	2. $224 - 56.73$	3. $6.12 - 4.923$
4. $24.5 \cdot 3.2$	5. $0.23 \cdot 7$	6. $3.86 \cdot 9.15$
7. $14.8 \div 5$	8. $46.3 \div 1.5$	9. $147 \div 2.25$
10. $24.33 - 2.5 \cdot 7$	11. $3.9 + 4.5^2$	12. $9.25(18.4 - 2 \cdot 1.2)$

Solve each word problem, showing all work.

13. Jeff had $46.18 in his wallet Monday morning. He gave half of his money to his brother. He then bought two donuts for $0.75 each and a cup of coffee for $2.99. How much money did Jeff have left?	14. Five friends split a $65.20 bill at a restaurant. They also each left $2.75 for the tip. How much money did each person pay in all?

Adding Fractions & Mixed Numbers

1. Find a common denominator for the two fractions.

2. Add the two numerators and keep the denominator the same.

3. Add the whole numbers.

4. Simplify the answer and/or change improper fraction answers to mixed numbers.

ex: $3\frac{3}{4} + 2\frac{1}{2}$

$$3\frac{3}{4} = 3\frac{3}{4}$$
$$+$$
$$2\frac{1}{2} = 2\frac{2}{4}$$
$$5\frac{5}{4} = \boxed{6\frac{1}{4}}$$

Subtracting Fractions & Mixed Numbers

1. Find a common denominator for the two fractions.

2. Subtract the two numerators and keep the denominators the same. If the top numerator is smaller than the bottom numerator, borrow from the whole number and rename the top fraction.

3. Subtract the whole numbers.

4. Simplify the answer.

ex: $5\frac{1}{4} - 1\frac{2}{3}$

$$5\frac{1}{4} = 5\frac{3}{12} = 4\frac{15}{12}$$
$$-$$
$$1\frac{2}{3} = 1\frac{8}{12} = 1\frac{8}{12}$$
$$\boxed{3\frac{7}{12}}$$

Multiplying Fractions & Mixed Numbers

1. Turn any mixed numbers and whole numbers into improper fractions.

2. Cross-simplify if possible.

3. Multiply the numerators and then multiply the denominators

4. Simplify the answer and/or change improper fraction answers to mixed numbers.

ex: $2\frac{1}{6} \cdot \frac{4}{7}$

$$\frac{13}{3\cancel{6}} \cdot \frac{\cancel{4}^{2}}{7} = \frac{26}{21} = \boxed{1\frac{5}{21}}$$

Dividing Fractions & Mixed Numbers

1. Turn any mixed numbers and whole numbers into improper fractions.

2. Keep the first fraction the same, change the division to multiplication, and flip the second fraction to its reciprocal.

3. Multiply the fractions.

4. Simplify the answer and/or change improper fraction answers to mixed numbers.

ex: $7 \div 1\frac{3}{4}$

$$\frac{7}{1} \div \frac{7}{4}$$
$$\downarrow$$
$$\frac{1\cancel{7}}{1} \cdot \frac{4}{\cancel{7}_{1}} = \frac{4}{1} = \boxed{4}$$

Evaluate each expression.

15. $\frac{4}{5} + \frac{3}{4}$	16. $4\frac{2}{7} + 2\frac{9}{14}$	17. $8\frac{11}{12} + 9\frac{5}{18}$
18. $6 - \frac{3}{8}$	19. $8\frac{3}{5} - 2\frac{1}{3}$	20. $4\frac{1}{6} - \frac{8}{9}$
21. $\frac{4}{25} \cdot \frac{15}{16}$	22. $2\frac{3}{4} \cdot 8$	23. $6\frac{5}{8} \cdot 3\frac{1}{2}$
24. $\frac{7}{9} \div \frac{2}{3}$	25. $\frac{4}{5} \div 10$	26. $5\frac{2}{3} \div 2\frac{5}{6}$

Solve each word problem, showing all work.

27. Jaimie ran $3\frac{1}{2}$ miles on Monday. She ran half as far on Tuesday as she did on Monday. How far did Jaimie run in all on Monday and Tuesday?	28. A $5\frac{1}{2}$ quart pot is filled $\frac{2}{3}$ of the way with water. How many more quarts of water can the pot hold?

Ratios

Ratios are comparisons of two quantities. There are 3 different ways to write ratios:

- Fraction $\left(\frac{A}{B}\right)$
- Colon (A:B)
- Word Form (A to B)

Ratios can be simplified just like fractions.

ex: write the ratio of triangles to circles in 3 ways: ▲ ▲ ▲ ▲ ◯ ◯

$$\frac{4}{2} = \boxed{\frac{2}{1}, \quad 2:1, \quad 2 \text{ to } 1}$$

Rates & Unit Rates

Rates are ratios that compare quantities measured in different units. A unit rate is a rate with a denominator of 1.

To convert a rate to a unit rate:

1. Divide the numerator by the denominator
2. Either write your answer as a fraction with a label for the both the numerator and denominator OR as one number labeled with the first unit "per" the second unit

ex: express as a unit rate: 125 miles in 4 hours

$$\frac{125 \text{ mi}}{4 \text{ hr}} \qquad 125 \div 4 = 31.25$$

$$\boxed{\frac{31.25 \text{ mi}}{1 \text{ hr}} \text{ or } 31.25 \text{ miles per hr}}$$

Fractions, Decimals, & Percent

To convert a:

- <u>Decimal to Percent</u>: move the decimal point 2 places to the right

  ex: $0.345 = \boxed{34.5\%}$

- <u>Percent to Decimal</u>: move the decimal point 2 places to the left

  ex: $7\% = \boxed{0.07}$

- <u>Decimal to Fraction</u>: write the decimal over the place value of the last digit and then simplify

  ex: $0.008 = \frac{8}{1000} = \boxed{\frac{1}{125}}$

- <u>Fraction to Decimal</u>: divide the numerator by the denominator

  ex: $\frac{1}{5} = 5\overline{)1.0}^{\;\boxed{0.2}}$

- <u>Percent to Fraction</u>: write the percent over 100 and then simplify

  ex: $45\% = \frac{45}{100} = \boxed{\frac{9}{20}}$

- <u>Fraction to Percent</u>: convert the fraction to a decimal and then convert the decimal to a percent

  ex: $\frac{3}{10} = 0.3 = \boxed{30\%}$

Percent of a Number

1. Turn the percent to a fraction or decimal.
2. Multiply the fraction/decimal by the number.

ex: Find 18% of 40

$$0.18 \cdot 40 = \boxed{7.2}$$

Write each ratio in 3 ways.

29. A bank contains 15 pennies and 12 nickels. Write the ratio of nickels to pennies.	30. A bowl contains 6 apples and some bananas. If there are a total of 10 pieces of fruit, find the ratio of apples to bananas.

Convert each rate to a unit rate.

31. $4.25 for 64 fluid ounces	32. 297 miles on 11 gallons of gas	33. 124 feet in 10 seconds

Complete the chart by converting each number to a percent, fraction, and/or decimal.

Fraction	Decimal	Percent
34. $\frac{3}{8}$		
35.	0.45	
36.		72%
37.	0.1	
38. $\frac{3}{200}$		

Find each percent of a number.

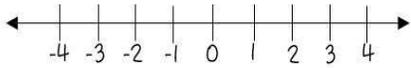| 39. 30% of 90	40. 15% of 38	41. 50% of 86
42. 75% of 160	43. 24% of 35	44. 2% of 74

Comparing Integers

Integers are numbers without fractional parts. They can be positive, negative, or zero. The further right a number is on the number line, the greater it is.
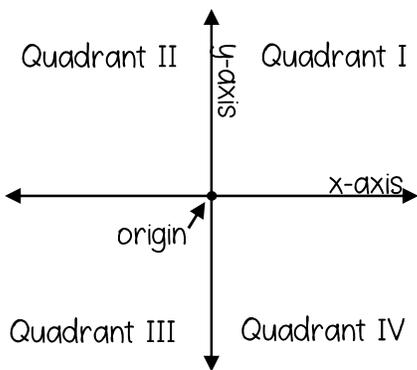

The absolute value of a number is the distance the number is from zero.

ex: compare with <, >, or =

-7 $\bigcirc$ $|-9|$ ← The absolute value of -9 = 9

-7 $\boxed{<}$ 9

The Coordinate Plane

Quadrant II   Quadrant I

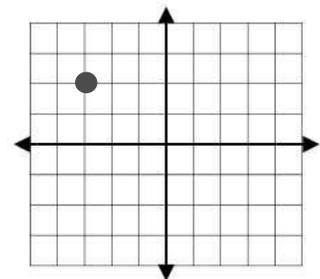Quadrant III   Quadrant IV

origin

x-axis

y-axis

Ordered Pair: (x, y)

To graph a point on the coordinate plane, start at the origin. The first number in the ordered pair (the x-coordinate) tells you how far left (if negative) or right (if positive) to move. The second number (the y-coordinate) tells you how far up (if positive) or down (if negative) to move.

ex: Graph the point (-3, 2) and state the quadrant in which it is located.
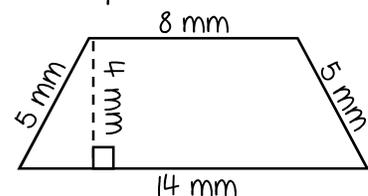
Start at the origin, and move LEFT 3 and UP 2

$\boxed{\text{Quadrant II}}$

Perimeter, Area and Volume

- Perimeter of Any Polygon: add all side lengths

- Area of a Rectangle: A = lw

- Area of Parallelogram: A = bh

- Area of Triangle: $A = \frac{1}{2}bh$

- Area of Trapezoid: $A = \frac{1}{2}h(b_1 + b_2)$

- Volume of Rectangular Prism: V = lwh

ex: Find the perimeter & area:

Perimeter: P = 5 + 8 + 5 + 14 = $\boxed{32 \text{ mm}}$

Area: This is a trapezoid, so use the area of a trapezoid formula: $A = \frac{1}{2}h(b_1 + b_2)$
The bases are the sides that are parallel, and the height is perpendicular to the bases.

→ $A = \frac{1}{2}(4)(8+14)$ = $\boxed{44 \text{ mm}^2}$

Compare the integers with <, >, or =.

45. -4 ◯ -5	46. 2 ◯ -2	47. |−5| ◯ |5|	48. -7 ◯ 6	49. -13 ◯ -9
50. |−7| ◯ -6	51. -17 ◯ -14	52. |−3| ◯ |−2|	53. 0 ◯ -6	54. |−4| ◯ |6|

Graph and label each of the ordered pairs in the coordinate plane. Then state the quadrant or axis in/on which the point is located.

55. A(2, 4)	56. B(0, -3)
57. C(1, -1)	58. D(3, 3)
59. E(-4, 1)	60. F(2, 0)
61. G(-3, -2)	62. H(-2, 3)
63. I(0, 2)	64. J(-1, -4)

Find the perimeter, area, and/or volume of the given figure.

65. Find the perimeter & area:	66. Find the perimeter & area:	67. Find the perimeter & area:
5 cm, 13 cm, 12 cm	3.5 in, 5 in, 8 in	$3\frac{1}{2}$ in
68. Find the perimeter & area:	69. Find the area of a square with a perimeter of 45 cm	70. Find the volume:
8 ft, 3.5 ft, 4 ft, 7 ft		$2\frac{1}{8}$ mm, $6\frac{3}{4}$ mm, 2 mm