Summer Math Packet

For Rising 7th – 8th Graders

Welcome to your summer math packet! Summer math is optional, and if completed it will be used as extra credit when you return to school in the Fall. There are 2 options for summer math extra credit: the math packet option and the Khan Academy option. **This is the math packet option for rising 7th and 8th graders.**

This packet has been created in order to help you stay current with your math skills. At the beginning of the 2020 - 2021 school year, we will begin Fall semester by reviewing the packets that you completed over the summer. Here is an analogy that will explain why the summer math packet is so important.

Math is like a sport. During the season you practice between games so that your skills are perfect for the games. In math your tests are like games and your homework is like practice. Between tests it is important to practice the concepts by doing the homework so that your skills are perfected for the test.

In the off-season, athletes still practice in order to keep their skills up. When the new season starts, they don't have to re-learn the skills because they have continued to practice them. Your summer break is like the off-season. Between school years you must practice your skills so you don't forget them while you are out of school. When the new school year begins, you won't have to re-learn all of the skills from the previous year because you never had time to forget. You practiced your skills and kept them on the same level.

The moral of this analogy is to not wait until the week before school starts to work on your summer math packet. By that time you will have allowed yourself to forget all of the important skills that you learned during the previous school year. Then you will have to rush to re-learn the material in the packet.

Create a schedule that has deadlines for when each section should be done. That way throughout the whole summer you can do a little bit at a time, instead of waiting until the end and doing it all at once. If you are having difficulties with any particular section, please contact me via e-mail and I will try to help as much as I can.

Good Luck and Have a Great Summer,

Josh Hersko
Math Instructor; jhersko@millsprings.org

Basic Addition

Show your work and write neatly.

1. 11 + 41	2. 44 + 18	3. 59 + 7	4. 34 + 40
5. 36 + 52	6. 27 + 57	7. 54 + 12	8. 41 + 9
9. 314 + 553	10. 266 + 227	11. 290 + 154	12. 163 + 763
13. 214 + 356	14. 122 + 281	15. 268 + 547	16. 169 + 800
17. 3501 + 1555	18. 5845 + 4063	19. 2178 + 4344	20. 1623 + 5845

Basic Subtraction

Show your work and write neatly.

1. 30 - 14	2. 47 - 13	3. 63 - 51	4. 91 - 5
5. 88 - 10	6. 61 - 31	7. 27 - 11	8. 57 - 21
9. 998 - 234	10. 303 - 185	11. 942 - 888	12. 841 - 706
13. 915 - 876	14. 577 - 359	15. 659 - 374	16. 960 - 681
17. 8701 - 6911	18. 5656 - 4867	19. 4223 - 2856	20. 4998 - 1776

Basic Multiplication

Show your work and write neatly.

1. 14 x 7	2. 32 x 2	3. 26 x 3	4. 15 x 4
5. 373 x 2	6. 167 x 6	7. 192 x 2	8. 314 x 2
9. 241 x 61	10. 394 x 32	11. 610 x 82	12. 203 x 98
13. 454 x 44	14. 252 x 63	15. 651 x 92	16. 729 x 46
17. 813 x 9	18. 193 x 4	19. 736 x 4	20. 532 x 7

Basic Division

Show your work and write neatly.

1. $2\overline{)28}$ 2. $5\overline{)40}$ 3. $9\overline{)36}$ 4. $2\overline{)48}$

5. $6\overline{)241}$ 6. $3\overline{)48}$ 7. $21\overline{)360}$ 8. $5\overline{)300}$

9. $20\overline{)240}$ 10. $20\overline{)40}$ 11. $10\overline{)40}$ 12. $50\overline{)500}$

13. $3\overline{)30}$ 14. $3\overline{)42}$ 15. $6\overline{)720}$ 16. $8\overline{)96}$

17. $30\overline{)270}$ 18. $4\overline{)368}$ 19. $3\overline{)366}$ 20. $4\overline{)560}$

Rules for Adding & Subtracting Integers

Rule #1: When adding numbers with the same sign, add just the numbers, and then keep the sign.

Rule #2: When adding numbers with different signs, subtract the numbers, and take the sign of the larger number.

Rule #3: When subtracting integers it is helpful to use a number line.

Step 1: On the number line, find the first integer. This is where you will start.

Step 2: When adding move right; when subtracting move left.

Step 3: The number where you stop is the answer.

Step #4: Subtracting a negative number means adding a negative. i.e. 5 - ¯4 = 5 + 4

Subtract/Negative **Add/Positive**

Practicing Adding & Subtracting Integers

1. $^{+}3 + {}^{+}1 =$ _____

2. $^{-}3 + {}^{-}4 =$ _____

3. $^{-}3 - {}^{+}5 =$ _____

4. $^{-}2 + {}^{+}7 =$ _____

5. $^{-}3 + {}^{-}1 =$ _____

6. $^{+}2 - {}^{+}7 =$ _____

7. $^{+}27 + {}^{-}13 =$ _____

8. $^{+}8 - {}^{-}15 =$ _____

9. $^{-}8 + {}^{-}9 =$ _____

10. $^{-}19 + {}^{+}25 =$ _____

11. $^{+}7 - {}^{+}17 =$ _____

12. $^{-}4 + {}^{-}11 =$ _____

13. $^{-}7 - {}^{-}3 =$ _____

14. $^{-}4 + {}^{+}3 =$ _____

15. $^{-}8 + {}^{+}7 =$ _____

16. $^{+}5 - {}^{-}9 =$ _____

17. $^{-}7 - {}^{+}5 =$ _____

18. $^{-}13 - {}^{+}7 =$ _____

19. $^{-}5 + {}^{-}13 =$ _____

20. $^{+}12 - {}^{+}7 =$ _____

21. $^{+}18 + {}^{-}12 =$ _____

22. $^{+}13 - {}^{-}8 =$ _____

23. $^{-}11 + {}^{-}10 =$ _____

24. $^{-}19 + {}^{+}2 =$ _____

Multiplying Integers

Rule #1: When multiplying numbers with the same sign, the answer will be positive.

Rule #2: When multiplying numbers with different signs, the answer will be negative.

1. (2)(-5) = _____

2. (-4)(8) = _____

3. (-4)(-1) = _____

4. (-6)(-3) = _____

5. (-2)(-3) = _____

6. (-3)(-3) = _____

7. (5)(-1) = _____

8. (2)(-5) = _____

9. (-2)(-2) = _____

10. (6)(-3) = _____

11. (3)(8) = _____

12. (-4)(-8) = _____

13. (-6)(-7) = _____

14. (4)(-5) = _____

15. (-6)(6) = _____

16. (-7)(0) = _____

Dividing Integers

Rule #1: When dividing numbers with the same sign, the answer will be positive.

Rule #2: When dividing numbers with different signs, the answer will be negative.

1. $25 \div (-5) =$ _____

2. $(-450) \div 9 =$ _____

3. $(-16) \div (-4) =$ _____

4. $(-66) \div (-3) =$ _____

5. $(-32) \div (-8) =$ _____

6. $(36) \div (-9) =$ _____

7. $5 \div (-1) =$ _____

8. $(25) \div (-5) =$ _____

9. $(-2) \div (-2) =$ _____

10. $(6) \div (-3) =$ _____

11. $(-42) \div (6) =$ _____

12. $(-81) \div (-9) =$ _____

13. $(96) \div (-8) =$ _____

14. $(-49) \div (7) =$ _____

15. $(-48) \div (-8) =$ _____

16. $(-99) \div (0) =$ _____

Improper Fractions & Mixed Numbers

Rule #1: When changing a mixed number into an improper fraction, multiply the denominator (bottom number) and the whole number. Add that product to the numerator (top number). Place that sum above the original denominator.

Example: $5\frac{3}{4} = \frac{5 \times 4 + 3}{4} = \frac{23}{4}$

1. $5\frac{1}{2}$ = _____

2. $6\frac{2}{3}$ = _____

3. $8\frac{4}{5}$ = _____

4. $3\frac{2}{9}$ = _____

5. $1\frac{9}{10}$ = _____

6. $11\frac{7}{11}$ = _____

Improper Fractions & Mixed Numbers (cont'd)

Rule #2: When changing an improper fraction into a mixed number, find how many times the denominator can fit into the numerator. That number will be the whole number. The remainder will be the numerator which will go above the original denominator.

Example: $\frac{24}{5} = 5\overline{)24}^{4}$ $\quad 5 \times 4 = 20$ $\quad 24 - 20 = 4$

$$\frac{24}{5} = 4\frac{4}{5}$$

1. $\frac{14}{5} =$ _____

2. $\frac{35}{6} =$ _____

3. $\frac{48}{7} =$ _____

4. $\frac{107}{10} =$ _____

5. $\frac{67}{6} =$ _____

6. $\frac{96}{12} =$ _____

Simplifying Fractions

Rule #1: A fraction is in simplest form the numerator and denominator cannot be dividing by the same number (except for 1).

Rule #2: To simplify a fraction, find the largest number both the numerator and denominator can be dividing by.

Example: $\frac{12}{36} = \frac{12 \div 12}{36 \div 12} = \frac{1}{3}$

1. $\frac{24}{36} =$ _____

2. $\frac{35}{45} =$ _____

3. $\frac{11}{121} =$ _____

4. $\frac{42}{63} =$ _____

5. $\frac{32}{48} =$ _____

6. $\frac{12}{18} =$ _____

7. $\frac{25}{100} =$ _____

8. $\frac{60}{96} =$ _____

Adding & Subtracting Like Fractions

Rule #1: When denominators are the same, simply add or subtract the numerators. Your answer will go above the original denominator.

Rule #2: Make sure you simplify your answer.

1. $\frac{5}{7} - \frac{2}{7} =$ ____

2. $\frac{4}{9} + \frac{5}{9} =$ ____

3. $\frac{4}{9} + \frac{2}{9} =$ ____

4. $\frac{4}{9} - \frac{1}{9} =$ ____

5. $\frac{4}{7} + \frac{5}{7} =$ ____

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

7. $\frac{9}{10} - \frac{5}{10} =$ ____

8. $\frac{6}{7} - \frac{3}{7} =$ ____

9. $\frac{3}{11} + \frac{7}{11} =$ ____

10. $\frac{5}{8} + \frac{7}{8} =$ ____

11. $\frac{3}{10} + \frac{7}{10} =$ ____

12. $\frac{14}{17} - \frac{10}{17} =$

Rules of Adding & Subtracting Fractions with Unlike Denominators

Rule #1: Find the Least Common Denominator.

Rule #2: Rewrite each fraction using the LCD.

Rule #3: Add or Subtract then write the answer in Simplest Form.

Example 1: $\frac{3}{5} + \frac{3}{10}$

Step 1: The LCD of 5 and 10 is 10.

Step 2: Rewrite each fraction with the new denominator.

$\frac{3}{5} = \frac{6}{10}$ $\quad \frac{3}{10} = \frac{3}{10}$

$$\frac{6}{10} + \frac{3}{10} = \frac{9}{10}$$

Example 2: $\frac{5}{6} - \frac{1}{9}$

Step 1: The LCD of 6 and 9 is 18.

Step 2: Rewrite each fraction with the new denominator.

$\frac{5}{6} = \frac{15}{18}$ and $\frac{1}{9} - \frac{2}{18}$

$$\frac{15}{18} - \frac{2}{18} = 13$$

$18 \quad 18 \quad \overline{18}$

Practicing Adding & Subtracting Unlike Fractions

1. $\frac{5}{12} + \frac{3}{8} =$ _____

2. $\frac{1}{2} + \frac{8}{9} =$ _____

3. $\frac{2}{5} + \frac{1}{3} =$ _____

4. $\frac{7}{10} + \frac{3}{4} =$ _____

5. $\frac{2}{3} + \frac{2}{9} =$ _____

6. $\frac{3}{8} - \frac{7}{10} =$ _____

7. $\frac{5}{12} - \frac{7}{9} =$ _____

8. $\frac{2}{9} - \frac{1}{2} =$ _____

9. $\frac{3}{4} - \frac{2}{7} =$ _____

10. $\frac{4}{9} - \frac{1}{5} =$ _____

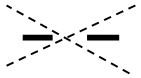
Rules for Multiplying Fractions

Method #1: Multiply the numerators and then the denominators. Simplify your answer.

Example: $\frac{4}{7} \times \frac{3}{8} = \frac{12}{56} = \frac{12 \div 4}{56 \div 4} = \frac{3}{16}$

Method #2: Cross Cancel your fractions then multiply.

Example:



Rules for Dividing Fractions

Step #1: Flip the second fraction to make its reciprocal.

Step #2: Now multiply using one of the methods listed above.

Example: $\frac{4}{5} \div \frac{8}{15} = \frac{4}{5} \times \frac{15}{8} = \frac{60}{40} = 1\frac{20}{40} = 1\frac{20 \div 20}{40 \div 20} = 1\frac{1}{2}$

$5 \div 5 = 1$

$9 \div 3 = 3$

$\frac{5}{9} \times \frac{6}{15}$

Practicing Multiplying & Dividing Fractions

1. $\frac{2}{8} \times \frac{3}{7} =$ _____

2. $\frac{7}{10} \times \frac{5}{6} =$ _____

3. $\frac{3}{5} \times \frac{5}{9} =$ _____

4. $\frac{2}{9} \times \frac{3}{11} =$ _____

5. $\frac{5}{6} \times \frac{3}{11} =$ _____

6. $\frac{7}{9} \times \frac{3}{7} =$ _____

7. $\frac{6}{11} \div \frac{3}{11} =$ _____

8. $\frac{3}{10} \div \frac{9}{15} =$ _____

9. $\frac{3}{5} \div \frac{9}{10} =$ _____

10. $\frac{3}{7} \div \frac{8}{12} =$ _____

11. $\frac{2}{9} \div \frac{3}{5} =$ _____

12. $\frac{7}{12} \div \frac{3}{4} =$ _____

Adding & Subtracting Decimals

Show your work and write neatly.

Rule #1: Line up the decimals and add or subtract.

Rule #2: For your answer, bring the decimal directly downward.

1. 8.5 + 1.51	2. 5.91 - 1.68	3. 9.7 + 1.57	4. 6.38 - 1.89
5. 4.93 + 0.94	6. 2.31 - 1.9	7. 6.92 + 0.43	8. 3.89 - 0.56
9. 5.34 + 0.54	10. 0.57 + 0.94	11. 8.19 - 0.22	12. 5.13 + 0.55
13. 5.23 - 1.34	14. 4.69 + 1.7	15. 9.75 - 1.03	16. 7.66 + 1.4 .
17. 3.24 + 0.99	18. 5.46 - 0.64	19. 8.45 + 1.5	20. 1.41 - 1.03
21. 1.41 - 1.03	22. 2.62 + 0.68	23. 2.58 - 1.86	24. 5.12 + 1.08

Rules for Multiplying & Dividing Decimals

When multiplying decimals, just multiply as with any other double-digit multiplication.

Then count how many decimal places are in the numbers in the problem. That number will be how many decimal places in the answer.

Example: **c = (3.9)(8.2)**

3.9 Å**One decimal place.**
X 8.2 Å**One decimal place.**
78
+3120
3198 Å**Move two decimal places.**

C = 31.98

To divide by a decimal you must make the divisor a whole number.

This means you must also move the decimal in the number being divided. You will write the decimal in the answer directly above the location of the decimal in the number being divided.

Example: **y = 42 ÷ (0.8)**

$0.8\overline{)42.}$ **Move the decimal in the divisor so that it is a whole number.**

$8.\overline{)420.}$ **You must also move the decimal in the number being divided.**

$8.\overline{)420.0}$ (52.5) **y = 52.5**

Practicing Multiplying & Dividing Decimals

1. 1.77×0.48

2. 2.23×0.34

3. 8.03×0.18

4. 0.07×0.55

5. 2.84×0.28

6. 7.14×0.09

7. 0.22×0.52

8. 9.82×1.84

9. $0.03\overline{)6.87}$

10. $1.42\overline{)2.13}$

11. $0.92\overline{)9.2}$

12. $0.12\overline{)1.38}$

13. $0.05\overline{)2.21}$

14. $0.9\overline{)1.08}$

Rules for Solving Equations

Rule #1: ***To solve an equation, find the value of the variable.***

Rule #2: ***For addition equations use subtraction to solve.***
And for subtraction equations use addition to solve.

Rule #3: ***For multiplication equations use division to solve.***
And for division equations use multiplication to solve.

Rule #4: ***Anything you do to one side of an equation, you must do to the other.***

Example 1: **x + 4 = 12** **Subtract 4 from both sides.**

x = 8

Example 2: **x – 9 = 10** **Add 9 to both sides.**

x = 19

Example 3: **4x = 36** **Divide both sides by 4.**

x = 9

Example 4: $\frac{x}{5} = 8$ **Multiply both sides by 5.**

x = 40

Practicing Solving Equations

1. $g + 13 = 5$ _____

2. $m + 28 = 13$ _____

3. $b - 32 = 15$ _____

4. $y - 78 = 23$ _____

5. $h + 5 = -10$ _____

6. $q + (-3) = 5$ _____

7. $g - (-3) = -11$ _____

8. $a + (-2) = -2$ _____

9. $3a = 27$ _____

10. $9p = 72$ _____

11. $\frac{d}{6} = 7$ _____

12. $\frac{a}{15} = 4$ _____

13. $-12 = -72d$ _____

14. $\frac{g}{-3} = -9$ _____

Rules for Solving Inequalities

Symbol	Meaning	Example
>	Is greater than	$7 > 4$
<	Is less than	$4 < 7$
≥	Is greater than or equal to	$x \geq 3$
≤	Is less than or equal to	$-2 \leq x$

Solving inequalities is very similar to solving equations. Most of the rules still apply, i.e. Everything you do to one side of an inequality you must to do the other.

MOST IMPORTANT DIFFERENCE: When dividing or multiplying by a negative number, the inequality sign will switch directions.

Graphing Inequalities

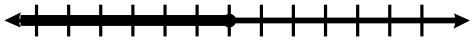
To graph a number on the number line, we draw a dot at the point that represents the number.

If the answer is < or > the dot will be open.

If the answer is ≤ or ≥ the dot will be filled in.

Depending on the inequality sign, you will either shade the numbers that are greater than or less than the selected number.

Example: x ≥ 4



Example: m ≤ 5

Solving Inequalities by Adding or Subtracting

Solve each inequality. Check your solution and graph your answer on the number line provided.

1. $h + 1 < y$ _____

2. $c + 3 > -4$ _____

3. $22 \leq m - 9$ _____

4. $p + (-8) \leq -12$ _____

5. $-13 < k - (-16)$ _____

Solving Inequalities by Multiplying or Dividing

1. $9x > 18$ _____

2. $10d \leq -80$ _____

3. $24 \geq \frac{g}{-2}$ _____

4. $\frac{f}{-5} < -12$ _____

5. $-100 \geq -10d$ _____

Solving Multi-Step Equations & Inequalities

1. $6p + 22 = 10$ _____

2. $\frac{r}{3} - 4 = 2$ _____

3. $5d - 9 = -24$ _____

4. $\frac{v}{-6} + 1 = 0$ _____

5. $\frac{x+3}{5} = -6$ _____

6. $\frac{2m-4}{5} = 6$ _____

7. $2x + 12 < -12$ _____

8. $3(d + 2) > 6$ _____