Summer Math Packet 2020

Dear Students,

The teachers in the math department are very excited about the upcoming school year. We look forward to working with you and helping you to become successful in your math classes.

The problems in this packet are a review of concepts that you have learned in your previous math classes. A strong knowledge of this material will help you in your future math classes.

Here are some suggestions for the summer math packet:

- Print the packet or get a printed copy from the school
- Work on one page or section a week
- Do NOT wait until the end of the summer to complete the whole packet
- Use the examples provided and watch videos online for extra help if needed
    - Khanacademy.com
    - Ixl.com
- Turn the completed packet into your teacher on the first day of school
    - When turned in on the first day of school, you will receive a homework pass from your teacher!!!!
    - This is a grade. It is not optional.

Email us if you have any questions. We will answer emails when we can over the summer.

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Thank you and have a great summer!

LSA Math Department

Central Tendencies

(Mean, Median, Mode, and Range)

Mean is the sum of the values in a set of data divided by the number of values.

Median is the middle value of a set of data written in ascending order (least to greatest). If there are two middle values the median is the mean of those two values.

Mode is the most frequent value in a set of data.

Range is the difference between the greatest and least value in a set of data.

Find the mean, median, mode, and range of each set of data. *Show all work. No calculators allowed.*

1. 108, 93, 426, 766, 518, 210

Mean: ___ Mode: ___

Median: ___ Range: ___

2. 21.5, 35.5, 49.5, 16.3, 35.5

Mean: ___ Mode: ___

Median: ___ Range: ___

GCF & LCM

Example: Find the Greatest Common Factor (GCF) and Least Common Multiple (LCM) of 24 and 32. Two methods listed below. Use either method.

GCF

Find the greatest common factor. I have shown two ways to do this.

*List the factors of 24 and 32. Find the greatest factor they share.

24: 1, 24, 2, 12, 3, 8, 4, & 6
32: 1, 32, 2, 16, 4, 8
→8 is the largest factor they share, so multiple 8 is the GCF.

LCM

Find the least common multiple. I have shown two ways to do this.

*List the first few multiples of 24 and 32. Find the smallest/least multiple they share.

24: 24, 28, 72, 96, 120
32: 32, 64, 96
→ 96 if the first/least/smallest they share, so 96 is the LCM.

-or-

GCF

GCF

Common Factors →

2	24	32
4	12	16
	3	4

GCF= 2 x 4 = 8

LCM

LCM

2	24	32
4	12	16
	3	4

LCM = 2 x 4 x 3 x 4 = 96

Find the GCF.

1. 42, 60 ___ 2. 11, 21 ___ 3. 48, 120 ___

Find the LCM.

4. 27, 18 ___ 5. 64, 78 ___ 6. 96, 200 ___

Fractions

Write each fraction in lowest terms. Example: $\frac{12}{40} = \frac{12 \div 4}{40 \div 4} = \frac{3}{10}$

1. $\frac{8}{24}$ = ____

2. $\frac{18}{45}$ = ____

3. $\frac{15x^2y}{20xy}$ = ____

Solve for x.

Example: $\frac{x}{10} = \frac{15}{50}$ ⇒ Use cross products to solve.

$50x = 10 \cdot 15 \Rightarrow \frac{50x}{50} = \frac{150}{50}$ (then divide both sides by 50) ⇒ $x = 3$

4. $\frac{16}{48} = \frac{x}{12}$
   x = ____

5. $\frac{12}{42} = \frac{4}{x}$
   x = ____

6. $\frac{20}{32} = \frac{x}{16}$
   x = ____

Write as improper fractions. Example: $6\frac{2}{4} = \frac{4 \times 6 + 2}{4} = \frac{26}{4}$

7. $2\frac{1}{3}$ = ____

8. $-4\frac{6}{7}$ = ____

9. $35\frac{3}{8}$ = ____

Write as mixed numbers. Example: $\frac{35}{3}$ = 35 ÷ 3 = 11 with 2 remaining.
Your answer is $11\frac{2}{3}$.

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

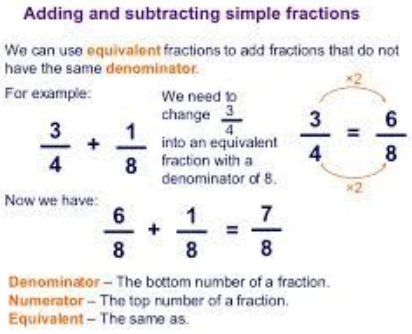
11. $\frac{38}{3}$ = ____

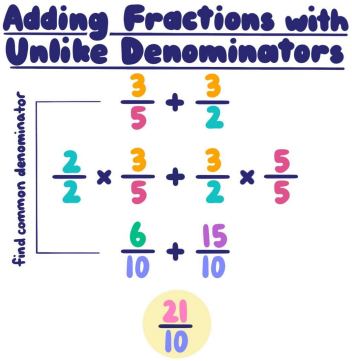
12. $\frac{52}{6}$ = ____

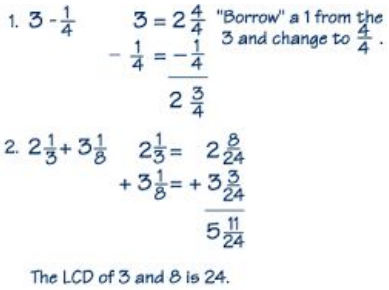
Fractions (continued)

Add or subtract. Write your answer in simplest form.

Example:







13. $3\frac{5}{9} + 2\frac{1}{6} =$ ____

14. $-\frac{2}{3} + \frac{1}{4} =$ ____

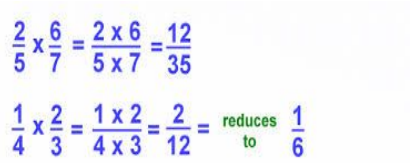
15. $6\frac{7}{10} + -1\frac{1}{5} =$ ____

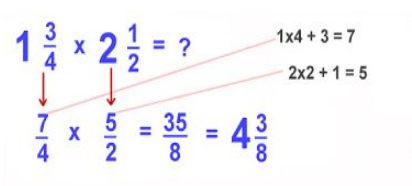
16. $\frac{3}{10} - \frac{4}{10} =$ ____

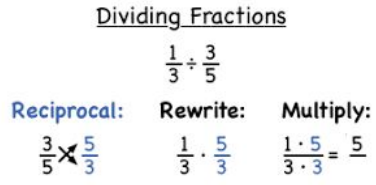
17. $5\frac{4}{11} + 2\frac{2}{3} =$ ____

18. $2\frac{7}{12} + 9\frac{2}{3} =$ ____

Multiply or divide. Write your answer in simplest form.







19. $-\frac{5}{6} \bullet \frac{6}{15} =$ ____

20. $-\frac{3}{4} \div -\frac{9}{16} =$ ____

21. $2\frac{2}{5} \bullet 3\frac{3}{4} =$ ____

22. $\frac{2}{9} \bullet \frac{3}{16} \bullet \frac{3}{6} =$ ____

23. $6\frac{3}{4} \div 4 =$ ____

24. $3\frac{3}{4} \bullet 4\frac{2}{3} =$ ____

Working with Integers

Adding and Subtracting:

1st: Rewrite all subtraction as addition then…

- If the integers have the same signs, add their absolute values. The sum will have the same sign of the addends.
- If the integers have different signs, subtract their absolute values. The sum has the sign of the addend with the greater absolute value.

Multiplying and Dividing:

- The product or quotient of two integers having the same sign is positive.
- The product or quotient of two integers having different signs is negative.

1. $-13 + 19$

2. $37 + (-13)$

3. $-18 + (-29)$

4. $-27 - 93$

5. $-46 - (-32)$

6. $9 - 83$

7. $-45 \div 9$

8. $-84 \div -12$

9. $\frac{132}{-11}$

10. $8(-17)$

11. $-24 \cdot -6$

12. $-62(8)$

13. There is a 6° drop in temperature over the past hour. If it is 55° now, what was the temperature an hour ago?

14. It is −9° now. The temperature will drop 5° in two hours. What will the temperature be in two hours?

Order of Operations

When several operations are indicated in a numerical expression, proceed in the following order: work within the parentheses, expand each power, multiply and divide (whichever comes first), and finally, add or subtract (whichever comes first).

PEMDAS ("**P**lease **E**xcuse **M**y **D**ear **A**unt **S**ally") is an acronym that provides a good way to remember your order of operation.

- **P**: Parentheses
- **E**: Exponents
- **MD**: Multiply or Divide, whichever comes first
- **AS**: Add or Subtract, whichever comes first

Simplify.

1. $2^4 - 3(3^2 - 8)$

_____

2. $(4^2 + 10)4 - 10(5^2 - 20)$

_____

3. $4^2 - 4(5^2 - 32 \div 8 \cdot 4)$

_____

4. $(8 \cdot 5 \div 10 + 2)(2^5 - 8^2 \div 2)$

_____

Evaluating Expressions

To evaluate an expression, first replace the variable by a given value. Then simplify the resulting numerical expression.

Evaluate the expression when $x = -2$ and $y = 5$.

1. $x + y$
2. $x^2 + y^3$
3. $2x - y$
4. $-2(y - 2x)$
5. $\frac{3x-y}{11}$
6. $\frac{x}{3-y}$

Properties of Operations

Commutative Property of Addition:
$a + b = b + a$

Commutative Property of Multiplication:
$a \times b = b \times a$

Associative Property of Addition:
$(a + b) + c = a + (b + c)$

Associative Property of Multiplication:
$(a \times b) \times c = a \times (b \times c)$

Identity Property of Addition:
$a + 0 = a$

Identity Property of Multiplication:
$a \times 1 = a$

Name the property illustrated by each expression.

1. $8 \times 12 = 12 \times 8$
2. $3 \times (2 \times 5) = (3 \times 2) \times 5$
3. $2 + 5 + 12 = 5 + 2 + 12$
4. $xy + 0 = xy$
5. $1x = x$
6. $5 + 7 = 7 + 5$
7. $3 + (4 + 5) = 3 + (5 + 4)$
8. $3xy = 3xy(1)$
9. $(4 + 8) + 5 = 4 + (8 + 5)$
10. $5 \times 6 \times 8 = 8 \times 5 \times 6$

Solving Equations

Procedure: To solve multi-step equations...

1. Fully simplify both sides of the equation
2. Get all variables to one side of the equation.
3. Use inverse operations to isolate the variable
   undo addition and subtraction first

Ex.

$$2x+3=7$$
$$-3 \quad -3$$
$$2x = 4$$
$$\frac{2x}{2} = \frac{4}{2}$$
$$\boxed{x = 2}$$

Ex.

$$2(x + 5) = 3x - 5$$
$$2x + 10 = 3x - 5$$
$$-2x \qquad -2x$$
$$10 = x - 5$$
$$+5 \qquad +5$$
$$\boxed{x = 15}$$

Exercises

Solve and check each equation.

1. $-2x + 7 = 25$

2. $3 - 8x = -141$

3. $15 - 2(w + 5) = 11$

4. $12 - 4r = 6r + 2$

5. $-4(n + 5) = -32$

6. $12 - 2x + 5 = -1$

7. $3 - 2x = 15$

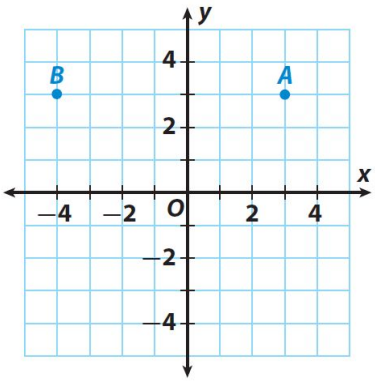
8. $\frac{z}{2} - 7 = 12$

9. $17 + 3x = 4x - 9$

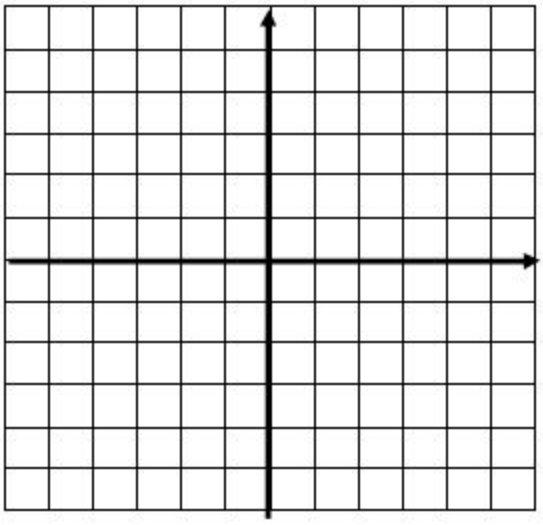
10. $-3(6f - 12) = 36 - 18f$

Coordinate Graph

Example:



Point B is (-4,3) Point A is (3, 3)

Plot each of the following points on the grid below. Use the letter to label the point on the graph.

A(3,0) B(5,5) C(-1,2) D(-3,-2) E(0,-3)