

Dear Parents and Students,

As educators, we realize that students experience a learning loss in mathematics if not academically engaged. Consequently, at the beginning of each school year we are forced to spend an inordinate amount of time reviewing concepts from the previous math course. Our solution for this problem is to expedite the review process in the form of a summer math packet.

The purpose of these packets is to have students review concepts taught during the school year so that there is no retention loss in key concept areas and to better prepare the students for the upcoming year in mathematics.

We ask that over the course of the summer, you download and print the summer math packet that corresponds to your child(ren). If your child is entering the 9th grade then you will download the “Incoming Geometry Students” packet. All work is to be turned in the first full day of school.

As teachers, we will still be reviewing, but not reteaching.

Should you have any questions regarding the math packet please feel free to contact:

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Thank you for your understanding and cooperation. Enjoy the summer! We look forward to working with you and your child during the upcoming 2016-2017 academic term.

7 th graders	“Incoming Pre-Algebra Students”
8 th graders	“Incoming Algebra 1 Students”
9 th graders	“Incoming Geometry Students”
10 th graders	“Incoming Algebra 2 with Trig Students”
11 th graders	“Incoming Pre-Calculus Students”
12 th graders	“Incoming Calculus Students”

Geometry Summer Review Packet

About Geometry:

Geometry teaches students to think, reason, and communicate critically and mathematically. This packet is designed to help you review those concepts necessary for your success in geometry. **Show all work for your problems.**

Fractions

Simplify the following fractions:

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

2. $\frac{21}{14} =$

3. $\frac{5}{20} =$

Write the following mixed numbers as improper fractions:

4. $2\frac{1}{7} =$

5. $-5\frac{7}{8} =$

6. $6\frac{3}{7} =$

Perform the indicated operation, and simplify if necessary:

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

5. $\frac{7}{8} - \frac{1}{2} =$

6. $\frac{6}{7} + \frac{3}{2} =$

7. $\frac{9}{2} + \frac{7}{5} =$

7. $\frac{15}{8} - \frac{12}{5} =$

8. $-\frac{3}{5} - \frac{2}{7} =$

9. $\frac{2}{3} \cdot \frac{5}{8} =$

10. $-\frac{5}{3} \cdot \frac{2}{5} =$

11. $\frac{4}{7} \cdot \frac{8}{3} =$

12. $\frac{1}{3} \div \frac{5}{2} =$

13. $\frac{1}{9} \div \frac{7}{8} =$

14. $-\frac{4}{5} \div \frac{1}{6} =$

15. $6 \cdot \frac{4}{5} =$

16. $15 \div \frac{3}{8} =$

17. $\frac{2}{7} \cdot 14 =$

Order of Operations

To avoid having different results for the same problem, mathematicians have agreed on an order of operations when simplifying expressions that contain multiple operations.

1. Perform any operation(s) inside grouping symbols. (Parentheses, brackets above or below a fraction bar)
2. Simplify any term with exponents.
3. Multiply and divide in order from left to right.
4. Add and subtract in order from left to right.

One easy way to remember the order of operations process is to remember the acronym PEMDAS or the old saying, "**Please Excuse My Dear Aunt Sally."**

P - Perform operations in grouping symbols
E - Simplify exponents
M - Perform multiplication and division in order from left to right
D
A - Perform addition and subtraction in order from left to right
S

Example 1

$$\begin{aligned} &2 - 3^2 + (6 + 3 \times 2) \\ &2 - 3^2 + (6 + 6) \\ &2 - 3^2 + 12 \\ &2 - 9 + 12 \\ &-7 + 12 \\ &= 5 \end{aligned}$$

Example 2

$$\begin{aligned} &-7 + 4 + (2^3 - 8 \div -4) \\ &-7 + 4 + (8 - 8 \div -4) \\ &-7 + 4 + (8 - -2) \\ &-7 + 4 + 10 \\ &-3 + 10 \\ &= 7 \end{aligned}$$

Evaluate each expression. Remember your order of operations process (PEMDAS).

1. $6 + 4 - 2 \cdot 3 =$

2. $(-2) \cdot 3 + 5 - 7 =$

3. $15 \div 3 \cdot 5 - 4 =$

4. $29 - 3 \cdot 9 + 4 =$

5. $20 - 7 \cdot 4 =$

6. $4 \cdot 9 - 9 + 7 =$

7. $50 - (17 + 8) =$

8. $(12 - 4) \div 8 =$

9. $12 \cdot 5 + 6 \div 6 =$

10. $18 - 4^2 + 7 =$

11. $3(2 + 7) - 9 \cdot 7 =$

12. $3 + 8 \cdot 2^2 - 4 =$

13. $16 \div 2 \cdot 5 \cdot 3 \div 6 =$

14. $12 \div 3 - 6 \cdot 2 - 8 \div 4 =$

15. $10 \cdot (3 - 6^2) + 8 \div 2 =$

16. $6.9 - 3.2 \cdot (10 \div 5) =$

17. $32 \div [16 \div (8 \div 2)] =$

18. $[10 + (2 \cdot 8)] \div 2 =$

19. $180 \div [2 + (12 \div 3)] =$

20. $\frac{1}{4}(3 \cdot 8) + 2 \cdot (-12) =$

21. $\frac{5 + [30 - (8 - 1)^2]}{11 - 2^2} =$

22. $\frac{3[10 - (27 \div 9)]}{4 - 7} =$

23. $5(14 - 39 \div 3) + 4 \cdot \frac{1}{4} =$

24. $[8 \cdot 2 - (3 + 9)] + [8 - 2 \cdot 3] =$

25. $162 \div [6(7 - 4)^2] \div 3 =$

Operations with Signed Numbers

Adding and Subtracting Signed Numbers

Adding Signed Numbers

Like Signs	Different Signs
Add the numbers & carry the sign	Subtract the numbers & carry the sign of the larger number
$(+) + (+) = +$ $(+3) + (+4) = +7$	$(+) + (-) = ?$ $(+3) + (-2) = +1$
$(-) + (-) = -$ $(-2) + (-3) = (-5)$	$(-) + (+) = ?$ $(-5) + (+3) = -2$

Subtracting Signed Numbers

Don't subtract! Change the problem to **addition** and change the sign of the **second** number. Then use the addition rules.

$(+9) - (+12) = (+9) + (-12)$	$(+4) - (-3) = (+4) + (+3)$
$(-5) - (+3) = (-5) + (-3)$	$(-1) - (-5) = (-1) + (+5)$

Simplify. **Do not use a calculator for this section.**

- $9 + -4 =$
- $-8 + 7 =$
- $-14 - 6 =$
- $-30 + -9 =$
- $14 - 20 =$
- $-2 + 11 =$
- $20 - -6 =$
- $7 - 10 =$
- $-6 - -7 =$
- $5 - 9 =$
- $-8 - 7 =$
- $1 - -12 =$

Multiplying and Dividing Signed Numbers

If the signs are the same,
the answer is *positive*

If the signs are different,
the answer is *negative*

Like Signs	Different Signs
$(+)(+) = +$ $(+3)(+4) = +12$	$(+)(-) = -$ $(+2)(-3) = -6$
$(-)(-) = +$ $(-5)(-3) = +15$	$(-)(+) = -$ $(-7)(+1) = -7$
$(+) / (+) = +$ $(+3) / (+4) = +12$	$(+) / (-) = -$ $(+2) / (-3) = -6$
$(+) / (+) = +$ $(+3) / (+4) = +12$	$(-) / (+) = -$ $(-7) / (+1) = -7$

Simplify. *Do not use a calculator for this section.*

1. $(-5)(-3) =$

7. $\frac{-7}{-1} =$

2. $\frac{-6}{2} =$

8. $(3)(-4) =$

3. $(2)(4) =$

9. $\frac{8}{-4} =$

4. $\frac{-12}{-4} =$

10. $(-2)(7) =$

5. $(-1)(-5) =$

11. $\frac{-20}{-1} =$

6. $\frac{-16}{8} =$

12. $(2)(-5) =$

Rounding Numbers

Step 1: Underline the place value in which you want to round.

Step 2: Look at the number to the right of that place value you want to round.

Step 3: If the number to the right of the place value you want to round is less than 5, keep the number the same and drop all other numbers.

If the number to the right of the place value you want to round is 5 or more, round up and drop the rest of the numbers.

Example: Round the following numbers to the tenths place.

Tenths

1. 23. <u>1</u> 246	2 is less than 5 so keep the 1 the same	23.1
2. 64. <u>2</u> 685	6 is greater than 5 so add one to the 2	64.3
3. 83. <u>9</u> 721	7 is greater than 5 so add one to the 9	$\begin{array}{r} 83.9721 \\ + 1 \\ \hline 84 \end{array}$

Round the following numbers to the **tenths** place.

- | | |
|------------------|-------------------|
| 1. 18.6231 _____ | 6. 0.2658 _____ |
| 2. 25.0543 _____ | 7. 100.9158 _____ |
| 3. 3.9215 _____ | 8. 19.9816 _____ |
| 4. 36.9913 _____ | 9. 17.1083 _____ |
| 5. 15.9199 _____ | 10. 0.6701 _____ |

Evaluating Expressions

Example

Evaluate the following expression when $x = 5$

Rewrite the expression substituting 5 for the x and simplify.

- a. $5x = 5(5) = 25$
- b. $-2x = -2(5) = -10$
- c. $x + 25 = 5 + 25 = 30$
- d. $5x - 15 = 5(5) - 15 = 25 - 15 = 10$
- e. $3x + 4 = 3(5) + 4 = 19$

Evaluate each expression given that: $x = 5$ $y = -4$ $z = 6$

1. $3x$

5. $y + 4$

2. $2x^2$

6. $5z - 6$

3. $3x^2 + y$

7. $xy + z$

4. $2(x + z) - y$

8. $2x + 3y - z$

Evaluate each expression given that: $x = 5$ $y = -4$ $z = 6$

9. $5x - (y + 2z)$

13. $5z + (y - x)$

10. $\frac{xy}{2}$

14. $2x^2 + 3$

11. $x^2 + y^2 + z^2$

15. $4x + 2y - z$

12. $2x(y + z)$

16. $\frac{yz}{2}$

Proportions

Solve each proportion for the missing value:

1. $\frac{2}{3} = \frac{x}{12}$

2. $\frac{5}{y} = \frac{10}{14}$

3. $\frac{15}{5} = \frac{9}{n}$

4. $\frac{x+2}{2} = \frac{4}{3}$

5. $\frac{2}{0.4} = \frac{15}{t}$

6. $\frac{.21}{2} = \frac{4}{a}$

Solve for each problem below by using proportions.

7. Sue was paid \$384 for working 32 hours. How many hours will she have to work to earn \$672 ?

8. Tommy drove 238 miles in 5 hours. How long will it take him to travel the next 72 miles, if he continues at the same speed ? (Give your answer in minutes)

9. Matt paid \$33.41 for 13 gallons of gasoline. How many gallons can he buy if he only has \$14 ?

Solving Equations

Solve the following equations.

1. $7x - 17 = 60$

2. $5y - 13 = 37$

3. $\frac{r+8}{-3} = -2$

4. $3(x+2) = 18$

5. $-2 + 10x = 8x - 1$

6. $2(a - 3) + 5 = 3(a - 1)$

7. $3 + \frac{2}{5}y = 11 - \frac{2}{5}y$

8. $-3(x + 5) = 8x + 18$

9. $-4y + 3y - 8 = 24$

10. $\frac{m}{-5} + 6 = 4$

11. $-4r + 5 - 6r = -32$

12. $6x + (-3) = -12$

13. $6y - 14 - 3y = 8(7 - (-2))$

14. $4c + 5c - 8c = 13 + 6$