Name: _____ Class: _____

For the 2016-2017 School Year

Eighth Grade Summer Math Packet

- This packet is designed to help you retain the information you learned in 7th grade math.
- It would be most helpful if you work on it in August (prior to the school, to help you prepare for 8th grade).
- The packet is due **Monday September 19th** and will be accepted until **Friday September 23rd**.
- The most important topics to review further for next year are INTEGERS (know your rules) and solving one-step equations such as $126 = -14k$.
  You must also know how to operate with fractions and decimals as well in addition to rounding answers to any given place value.
- Use websites to help you strengthen your skills in these areas!
  (ex. www.math.com , www.khanacadamy.org , www.mathisfun.com, http://www.purplemath.com)

****NOTE: PLEASE CHECK YOUR PRINTED OUT PACKET WITH THE ONE YOU SEE ON YOUR COMPUTER AS SOME SYMBOLS SOMETIMES DO NOT PRINT CORRECTLY (especially on Mac computers). ****

Have a Wonderful Summer!

Your eighth grade teachers look forward to working with you next year.

Topic: Integers

Examples:

Addition	Subtraction	Multiplication	Division
Same signs: *Add & keep sign* $^{+}6 + {}^{+}5 = {}^{+}11$ $^{-}8 + {}^{-}2 = {}^{-}10$	*Keep–Change–Opposite* $^{+}10 - {}^{-}8 = {}^{+}10 + {}^{+}8 = 18$ $^{-}5 - {}^{+}12 = {}^{-}5 + {}^{-}12$	*Same signs:* *Positive product* $({}^{+}7)({}^{+}8) = {}^{+}56$ $({}^{-}2)({}^{-}6) = {}^{+}12$	*Same signs:* *Positive quotient* $^{+}42 / {}^{+}6 = {}^{+}7$ $^{-}24 / {}^{-}8 = {}^{+}3$
Different signs: *Subtract & take sign of larger value* $^{+}9 + {}^{-}5 = {}^{+}4$ $^{-}6 + {}^{+}1 = {}^{-}5$	$^{-}20 - {}^{-}8 = {}^{-}20 + {}^{-}8 = {}^{-}12$	*Different signs:* *Negative product* $({}^{+}3)({}^{-}9) = {}^{-}27$ $({}^{-}5)({}^{+}4) = {}^{-}20$	*Different signs:* *Negative quotient* $^{+}56 / {}^{-}7 = {}^{-}8$ $^{-}50 / {}^{+}2 = {}^{-}25$

Recall the **order of operations**:

1 – **P**arentheses (or grouping symbols)
2 - **E**xponents
3 - **M**ultiplication / **D**ivision (left to right)
4 - **A**ddition/**S**ubtraction (left to right)

Find each answer.

1. $^{-}12 + (^{-}7) =$ ____
2. $^{-}25 + 18 =$ ____
3. $2 + (^{-}25) =$ ____
4. $^{-}28 - (^{-}8) =$ ____
5. $11 - (5) =$ ____
6. $^{-}21 - 4 =$ ____
7. $(^{-}9)(^{-}8) =$ ____
8. $(2)(^{-}12) =$ ____
9. $-35 / -7 =$ ____
10. $-48 / +8 =$ ____
11. $(-2)(+6)(-5) =$ ____
12. $-30 + \frac{24}{6} \cdot (-2) =$ ____
13. $\frac{16}{4} + 2 \cdot (-8) =$ ____
14. $-3(1-8) + 2^3 =$ ____

Answers:

1. ____
2. ____
3. ____
4. ____
5. ____
6. ____
7. ____
8. ____
9. ____
10. ____
11. ____
12. ____
13. ____
14. ____

Topic: Rationals

Multiplying Fractions and Mixed Numbers
1) **Change any mixed numbers to improper fractions**
2) *Cross – cancel* ***any*** *numerator with* ***any*** *denominator* by dividing each by a *common factor*
3) Multiply numerator by numerator and denominator by denominator
4) Simplify your answer (make it a mixed number if you can)

Dividing Fractions and Mixed Numbers
1) **Change any mixed numbers to improper fractions**
2) Remember Keep-Change-Flip: keep the first fraction, change the division sign to a multiplication sign, and flip the second fraction
3) Multiply numerator by numerator and denominator by denominator
4) Simplify your answer (make it a mixed number if you can)

Adding and Subtracting Fractions and Mixed Numbers
1) Check to see if the denominators are the same; if not, *find a common denominator*
2) Now add or subtract the fractions – remember, **keep the denominator!**
3) Add or subtract the whole numbers
4) Simplify the fraction
5) Rewrite the sum or difference

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

2) $8\frac{4}{5}-3\frac{2}{5}=$

3) $5\frac{2}{11}-2\frac{1}{2}=$

4) $12-4\frac{3}{5}=$

5) $-2\frac{1}{3}-5\frac{3}{4}=$

6) $-5\frac{5}{6}+12\frac{3}{8}=$

7) $3\frac{1}{3}\cdot 7\frac{1}{2}=$

8) $\frac{3\frac{1}{5}}{-\frac{5}{6}}=$

9) $\frac{-6\frac{2}{3}}{-3\frac{3}{4}}=$

Answers:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____

Topic: Combining Like Terms and Applying the Distributive Property

In algebraic expressions, like terms are terms that contain the same variables raised to the same power. Only the coefficients of like terms may be different.

In order to **combine like terms**, we add or subtract the numerical coefficients of the like terms using the Distributive Property: $ax + bx = (a + b)x$.

Examples:
1. $2x + 9x = (2 + 9)x = 11x$
2. $12y - 7y = (12 - 7)y = 5y$
3. $5x + 8 - 2x + 7 = 3x + 15$

Here, the like terms are: $5x$ and $-2x = 3x$
and: $8 + 7 = 15$

The **Distributive Property** of multiplication over addition/subtraction is frequently used in Algebra:

Examples:
1. $7(2x + 9) = 7 \cdot 2x + 7 \cdot 9 = 14x + 63$
2. $4(6 - 5x) = 4(6) - 4(5x) = 24 - 20x$

Answers:

Simplify each expression by combining like terms.

1. $8y + 2y$ 1. _____
2. $10 - 6y + 4y + 9 =$ 2. _____
3. $3x + 7 - 2x =$ 3. _____
4. $8n - 7y - 12n + 5 - 3y =$ 4. _____

Apply the distributive property and write your answer in simplest form.

5. $7(x - 4) =$ 5. _____
6. $5(4n - 3) =$ 6. _____
7. $-6(3y + 5) =$ 7. _____
8. $-4(8 - 9x) =$ 8. _____
9. $8(3n + 7) - 10n =$ 9. _____
10. $-4(5 + 7y) + 6(2y - 9) =$ 10. _____

Topic: Algebra

Solving equations by using the Addition, Subtraction or Multiplication Property of Equality. Check the solution.

Ex 1: $\frac{1}{2}x + 5 = 9$

$-5 \quad = -5$

$\frac{2}{1} \cdot \frac{1}{2}x = 4 \cdot 2$

$x = 8$

Check: $\frac{1}{2}x + 5 = 9$

$\frac{1}{2}(\frac{8}{1}) + 5 = 9$

$4 + 5 = 9$

$9 = 9$

Ex 2: $7x - 6 - 11x = -14$

$7x - 6 - 11x = -14$

$-4x - 6 = -14$

$+6 \quad +6$

$\frac{-4x}{-4} = \frac{-8}{-4}$

$x = 2$

Check:

$7x - 6 - 11x = -14$

$7(2) - 6 - 11(2) = -14$

$14 - 6 - 22 = -14$

$8 - 22 = -14$

$-14 = -14$

Translate and evaluate the following equations.

Ex 3: The product of 4 and a number is 28.

$4 \cdot n = 28$

$\frac{4n}{4} = \frac{28}{4}$

$n = 7$

Addition: sum, more than
Multiplication: product

Ex 4. The quotient of a number and 3 is 15.

$\frac{n}{3} = 15$

$n = 45$

Subtraction: difference, less than
Division: quotient

Solve the following equations. Show your work and check your solution.

1. $2x - 5 = 17$

Check:

2. $\frac{1}{3}x - 9 = -12$

Check:

3. $5x + 8 = -12$

Check:

4. $-4x + 8 = 32$

5. $\frac{x}{4} + 8 = 20$

Apply the distributive property first.

6. $2(x - 7) = 8$

Check:

Check:

Check:

Apply the distributive property first.

7. $8x - 5 - 6x = 7$

8. $3 = 4x - 10x + 15$

9. $6x - (3 + 8x) = -11$

Check:

Check:

Check:

Translate each sentence to an algebraic equation. Then use mental math to find the solution.

	Equation	*Solution*
10. One-half of a number is -12.	_____	_____
11. 6 more than 7 times a number is 41.	_____	_____
12. 5 less than three times a number is 10.	_____	_____
13. 16 increased by twice a number is – 24.	_____	_____

Reflection

1. Going into 8th grade math, what do you believe your strengths are?

2. What 7th grade topics were challenging for you?

3. In completing this packet, what topics did you find the easiest to complete?

4. What topics do you think you need more practice with?

5. Tell us something you think your 8th grade math teachers should know about you?