

5-29-18

Aim: SWBAT review.

HW: Final Exam Tuesday June 12th

Textbook due on or before the final exam

Do Now: Review Packet and Calculator

Name: Answer KeyTeacher: Aivaliotis**FINAL REVIEW PACKET MATH 7R**

This Packet is a review of we covered this year in 7<sup>th</sup> grade mathematics.

- Unit 1: Rational Numbers
- Unit 2: Expressions, Equations & Inequalities
- Unit 3: Ratios & Proportionality
- Unit 4: Statistics & Probability
- Unit 5: Geometry

Reviewing for the final exam is YOUR job! This packet will assist you in this process. The packet is organized by unit. Within each unit you will find important notes as well as practice problems.

When pages are assigned in this packet, it means you should READ the notes AND complete all practice problems on those pages. If you skip the notes, you are not doing all of your job.

Its OK to go ahead . . . everything in this packet is review. Pay attention to topics you struggled with throughout the year. Look for those problems in the packet and go to extra help if you are still having difficulty with them. Remember, math is cumulative and you will need most of what you have learned this year in 8<sup>th</sup> grade!

If you get stuck on a problem:

- Go back and see if there are notes in the review packet to assist you
- Check the Unit # and go back to you class notes for help
- Use online resources (i.e. teacher's websites)
- Ask in class or go to extra help and ask your teacher

My math teacher has extra help: Monday after school

Thursday after school

The Math Final Exam is on Tuesday June 12<sup>th</sup>

### Unit 1: Rational Numbers

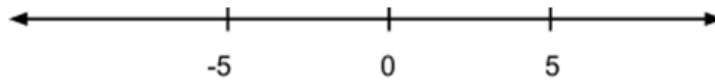
**Sets Of Numbers**

Counting Numbers - are the Natural Numbers (1, 2, 3, 4 ...)

Whole Numbers - all the Counting Numbers AND zero (0, 1, 2, 3, 4, ...)

Integers - all the Whole Numbers AND their opposites (...,-4, -3, -2, -1, 0, 1, 2, 3, 4, ...)

Opposite numbers are the same distance from zero on a number line in opposite directions. For example 5 and -5 are opposites.



**Comparing Integers : > and <**

The number farther right on the number line is the larger number.

- 1) 15 > -15    2) 92 > 63    3) 0 < 12    4) -5 < 0    5) -5 > -18

**Ordering Integers:**

- 6) Order from least to greatest: 6, -5, 3, -9, 0, -3 -9, -5, -3, 0, 3, 6

\*\*The three questions most often missed.

- 7) Name a number that is not an integer? 0.24 (any fraction or decimal)  
 8) Name the largest negative integer. -1  
 9) Name the smallest positive integer. 1



Absolute Value measures the distance a number is from zero on the number line.

The symbol for absolute value is "| |."

|4| "What is the absolute value of 4?" |4| = 4  
 |-4| "What is the absolute value of -4?" |-4| = 4

\*\*Absolute value bars are evaluated like parentheses. Do whatever is inside the bars first, and then find the absolute value.

|-4| + |5|  
 4 + 5  
 9

|-4 + 5|  
 | 1 |  
 1

10) |102| - |-2|  
 102 - 2  
100

11) |102 - -2| |102 + 2|  
 |104|  
104

12) |12| + |-16|  
 12 + 16  
28

13) |12 - 16|  
 |-4|  
4

14) -|10| - |-2|  
 -10 - 2  
-12

15) - (|102| - |2|)  
 -(102 - 2)  
 -(100)  
-100

The negative symbol "-" means opposite. For example the "opposite of 4" is -4.

Simplify the expression. (Start from the inside and work it out)

16) - (-4) 4

17) - (- (-4)) -4

18) - [- (- (-4))] 4

19) -(-(-36 - 4))  
 -(-(-40))  
-40

20) -(3<sup>2</sup>)  
 -(9)  
-9

21) -3<sup>2</sup>  
 the opposite of  
 3 squared  
-9

22) (-3)<sup>2</sup>  
 negative 3  
 squared  
 -3 • -3  
9

ADDING/SUBTRACTING INTEGERS: (Try these WITHOUT your calculator!)

- Get rid of Double Signs First!
  - SAME SIGNS, ADD the numbers and KEEP the sign.
  - DIFFERENT signs IGNORE the signs and SUBTRACT numbers. Keep the sign of whatever you have more of. Subtract the absolute values. Keep the sign of the number with the largest absolute value.

$$\begin{array}{r}
 23) \overset{-}{12} + \overset{-}{20} \\
 12 - 20 \\
 -8
 \end{array}
 \quad
 \begin{array}{r}
 24) \overset{-}{-20} + \overset{-}{-10} + 5 \\
 -20 - 10 + 5 \\
 -25
 \end{array}
 \quad
 \begin{array}{r}
 25) -15 + 7 + 8 \\
 0
 \end{array}
 \quad
 \begin{array}{r}
 26) 5 - 8 \\
 -3
 \end{array}
 \quad
 \begin{array}{r}
 27) -21 \overset{+}{-} (-14) \\
 -21 + 14 \\
 -7
 \end{array}$$

MULTIPLYING and DIVIDING INTEGERS: (Try these WITHOUT your calculator!)

TWO SAME SIGNS your answer will be POSITIVE.

TWO DIFFERENT SIGNS your answer will be NEGATIVE.

$$\begin{array}{r}
 28) (100)(-7) \\
 -700
 \end{array}
 \quad
 \begin{array}{r}
 29) (-6)(13) \\
 -78
 \end{array}
 \quad
 \begin{array}{r}
 30) -9(-11) \\
 99
 \end{array}
 \quad
 \begin{array}{r}
 31) (-15)(7) \\
 -105
 \end{array}$$

$$\begin{array}{r}
 32) -144 \div 12 \\
 -12
 \end{array}
 \quad
 \begin{array}{r}
 33) 62 \div 2 \\
 31
 \end{array}
 \quad
 \begin{array}{r}
 34) \frac{-150}{30} \\
 -5
 \end{array}
 \quad
 \begin{array}{r}
 35) -90 \div -15 \\
 6
 \end{array}$$

Write a number sentence and evaluate.

- 36) A dolphin swam to a depth of 110 feet below sea level. Then, it rose 85 feet. What was the dolphin's final depth?

$$\begin{array}{r}
 -110 + 85 = x \\
 -25 = x
 \end{array}$$

25 feet below sea level

- 37) The temperature outside was  $22^{\circ}\text{F}$ . The wind chill made it feel like  $-8^{\circ}\text{F}$ . Find the difference between the real temperature and the apparent temperature.

$$\begin{array}{r}
 22 - (-8) = x \\
 30 = x
 \end{array}$$

30 degree difference

- 38) The temperature one morning in was  $-16^{\circ}\text{F}$ . By the afternoon, the temperature had risen  $9^{\circ}\text{F}$ . What was the temperature in the afternoon?

$$\begin{array}{r}
 -16 + 9 = x \\
 -7 = x
 \end{array}$$

-7

FRACTIONS

- 39) Write  $\frac{17}{5}$  as a mixed number.  $3\frac{2}{5}$       40) Write  $-\frac{20}{6}$  as a mixed number.  $-3\frac{1}{3}$

Write each mixed number as a fraction.

$$\begin{array}{r}
 41) 2\frac{1}{3} \quad \frac{7}{3}
 \end{array}
 \quad
 \begin{array}{r}
 42) 3\frac{2}{5} \quad \frac{17}{5}
 \end{array}
 \quad
 \begin{array}{r}
 43) -5\frac{4}{9} \quad -\frac{49}{9}
 \end{array}
 \quad
 \begin{array}{r}
 44) -2\frac{4}{7} \quad -\frac{18}{7}
 \end{array}$$

Write each ratio as a FRACTION in SIMPLEST FORM.

45)  $\frac{3}{12}$   $\frac{1}{4}$

46) 20 to 5  $\frac{4}{1}$

47) 30 : 18  $\frac{5}{3}$

48) A bag contains 6 peaches, 4 plums, and 3 bananas. What is the ratio of plums to peaches?

A)  $\frac{2}{3}$

B)  $\frac{1}{2}$

C)  $\frac{3}{4}$

$\frac{4 \text{ plums}}{6 \text{ peaches}}$  D)  $\frac{3}{2}$

49) A bag contains 5 red marbles, 7 blue marbles, and 3 green marbles. What is the ratio of blue marbles to the number of marbles in the bag?

A)  $\frac{7}{12}$

B)  $\frac{15}{7}$

C)  $\frac{7}{15}$

$\frac{7 \text{ blue}}{15 \text{ marbles}}$  D)  $\frac{3}{15}$

### Adding and Subtracting Fractions & Mixed Numbers:

- Remember to use your integer rules.
- Find the Least Common Denominator (LCD) if the denominators are different.
- Add or subtract the numerator and keep the denominator the same.

Practice #'s 50, 51 & 52 WITHOUT your calculator!

50)  $\frac{3}{5} + \frac{2}{15}$

$\frac{11}{15}$

51)  $2\frac{4}{5} - \frac{1}{4}$

$2\frac{11}{20}$

52)  $3\frac{1}{10} + 5\frac{1}{4}$

$8\frac{7}{20}$

53)  $-\frac{2}{5} + \left(-\frac{5}{6}\right)$

$-1\frac{7}{30}$

54)  $-4\frac{2}{3} - \left(-3\frac{4}{5}\right)$

$-\frac{13}{15}$

55)  $3\frac{5}{8} - \left(-1\frac{1}{3}\right)$

$4\frac{23}{24}$

### Multiplying Fractions: (Try these WITHOUT your calculator!)

- Use your integer rules to determine whether your answer is going to be positive or negative.
- Change any mixed numbers to improper fractions (if necessary).
- Multiply the numerators and multiply the denominators. Look to simplify before you multiply.
- State your final answer in simplest form (fraction or mixed number).

56)  $-\frac{9}{10} \cdot \frac{2}{3}$

$-\frac{3}{5}$

57)  $-\frac{5}{6} \cdot -1\frac{4}{5}$

$1\frac{1}{2}$

58)  $2\frac{1}{2} \cdot 1\frac{2}{5}$

$3\frac{1}{2}$

59)  $-4\frac{1}{4} \cdot 3\frac{1}{3}$

$-14\frac{1}{6}$

Find the **multiplicative inverse** (**reciprocal**) of each fraction.

60)  $\frac{4}{7} \cdot \frac{7}{4}$

61)  $\frac{2}{11} \cdot \frac{11}{2}$

62)  $-2\frac{7}{10} \rightarrow -\frac{27}{10} \rightarrow \frac{10}{27}$

63)  $3\frac{5}{9} \rightarrow \frac{32}{9} \rightarrow \frac{9}{32}$

### Dividing Fractions & Mixed Numbers

- To divide fractions, multiply the first fraction by the multiplicative inverse (reciprocal) of the second fraction. You can use the key words "keep, change, flip" to help you remember the steps of this process.

Practice #'s 64, 65 & 66 WITHOUT your calculator!

64)  $-\frac{2}{3} \div \frac{5}{6} = -\frac{4}{5}$

65)  $-5\frac{2}{5} \div (-2\frac{1}{10}) = 2\frac{4}{7}$

66)  $-3\frac{1}{4} \div (-8\frac{2}{3}) = \frac{3}{8}$

67)  $3\frac{3}{4} \div 2\frac{1}{2} = 1\frac{1}{2}$

68)  $7\frac{1}{2} \div 2\frac{1}{10} = 3\frac{4}{7}$

69)  $\frac{4}{5} \div -6 = -\frac{2}{15}$

### Decimals

Round each of the following to the specified place.

70) 58.6857 Nearest Whole: 59

71) 4.0999 Nearest Whole: 4

58.6857 Tenths: 58.7

4.0999 Tenths: 4.1

58.6857 Hundredths: 58.69

4.0999 Hundredths: 4.10

58.6857 Thousandths: 58.686

4.0999 Thousandths: 4.100

72) List the following numbers in order from least to greatest:  $6.\bar{6}$ , 6.75, 6.07, 6.7  
6.07; 6. $\bar{6}$ ; 6.7; 6.75

Using  $<$ ,  $>$  or  $=$ , compare the following.

73)  $0.0604 < 0.0620$

74)  $-2.0 > -2.8$

75)  $3.3 > 3.25$   
3.30

Change into a decimal. (Divide the numerator of the fraction by the denominator)

76)  $\frac{1}{8} = \underline{0.125}$

77)  $5\frac{2}{3} = \underline{5.\bar{6}}$

78)  $3\frac{1}{4} = \underline{3.25}$

**Change into fraction or mixed number.** (Make each decimal part a fraction over a power of 10. Remember the number of decimal places will determine the # of zeros in the denominator)

79)  $0.75 \rightarrow \frac{75}{100} \rightarrow \frac{3}{4}$       80)  $4.6 \rightarrow 4\frac{6}{10} \rightarrow 4\frac{3}{5}$       81)  $-0.8 \rightarrow -\frac{8}{10} \rightarrow -\frac{4}{5}$

**Adding and Subtracting Decimals:** (Try these WITHOUT your calculator!)

- Always line up decimals, add zeroes to help line things up.
- Add and subtract but remember to carry over or borrow if necessary.
- Bring decimal straight down in your answers.

82)  $3.72 - 0.55 = 3.17$       83)  $-2.34 - 0.4 = -2.74$       84)  $-5.44 + 12.2 = 6.76$       85)  $7.5 + 4.33 = 11.83$       86)  $0.34 + 3.2 = 3.54$

**Multiplying Decimals:** (Try these WITHOUT your calculator!)

- Multiply the number like you would whole numbers, carry over when necessary.
- Count the number of decimal spaces for the original two factors.
- The decimal places in the product is the sum of decimal places in the factors.

87)  $-2.4 \cdot (-2.3) = 5.52$       88)  $0.4 \cdot (-1.6) = -0.64$       89)  $0.24 \cdot (2.2) = 0.528$       90)  $1.14 \cdot (0.83) = 0.9462$

**Dividing Decimals:** (Try these WITHOUT your calculator!)

- Move the decimal right in the dividend the same amount it's moved in the divisor
- Rewrite the problem as two integers
- Bring the decimal point up on top of quotient
- Do normal division add zeroes if needed

$$\begin{array}{r} \text{quotient} \\ \hline \text{divisor} \overline{) \text{dividend}} \end{array}$$

91)  $-5.4 \div 9 = -0.6$       92)  $3.96 \div 0.6 = 6.6$       93)  $-4.8 \div (-2.2) = 2.\overline{18}$       94)  $0.96 \div 0.02 = 48$

**Evaluating Expressions using the Order of Operations:** You MUST show your substitution, but you can use your calculator to compute the answer.

Evaluate each expression when  $a = 2$ ,  $b = -3$ , and  $c = \frac{1}{3}$

95) $4a + c$ $4 \cdot 2 + \frac{1}{3}$ $8\frac{1}{3}$	96) $2b - 3c$ $2 \cdot -3 - 3 \cdot \frac{1}{3}$ $-7$	97) $\frac{c}{4} + \frac{2}{3}$ $\frac{\frac{1}{3}}{4} + \frac{2}{3}$ $\frac{3}{4}$	98) $2ab + 2bc$ $2 \cdot 2 \cdot -3 + 2 \cdot -3 \cdot \frac{1}{3}$ $-14$
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Evaluate each expression when  $x = 1.6$  and  $y = -\frac{1}{2}$

99) $x - y$ $1.6 - (-\frac{1}{2})$ $2.1$	100) $3x + 2y$ $3(1.6) + 2(-\frac{1}{2})$ $3.8$	101) $\frac{x}{2} + y$ $\frac{1.6}{2} + (-\frac{1}{2})$ $0.3$	102) $25 - x - 6y$ $25 - 1.6 - 6(-\frac{1}{2})$ $26.4$
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### Unit 2: Expressions, Equations & Inequalities

**When translating into mathematical expressions . . .**

- Identify the key words
- Translated in the exact order they are read
- Switch the order ONLY when you read: "less than", "more than", "fewer than", "subtracted from" and "taken away from"
- Place parentheses around sums and differences

**Translate each verbal phrase or sentence into an algebraic expression.**

- 1) 12 more than a number  $n$   $n + 12$
- 2) A number,  $n$ , increased by seven  $n + 7$
- 3) The product of 15 and  $x$   $15x$
- 4) Twice  $y$  decreased by 20  $2y - 20$
- 5) Seven more than the quotient of  $x$  and  $-2$ .  $\frac{x}{-2} + 7$
- 6) The (difference) of twice  $n$  and three  $(2n - 3)$
- 7) Three times the (sum) of 12 and  $x$   $3(12 + x)$