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## CHAPTER 5 STUDY GUIDE (RATIONAL NUMBERS)

### 5.1 Forms of Rational Numbers examples on pages 180-184 (see Chapter 5.1 notes)

Numerator (N for North)

Denominator (D for Down)

- **Tips: Rational Number** = is any number that can be written in the form  $a/b$  where  $a$  and  $b$  are integers and  $b \neq 0$
- **Tips: Lowest Term** = to reduce a fraction to its lowest terms (also called simplified), to do this find the GCF of the numerator and denominator
- **Tips: Proper Fraction** = is when the numerator (top) is less than its denominator (bottom)
- **Tips: Improper Fraction** = if the numerator (top) is greater than or equal to the denominator (bottom)
- **Tips: Mixed Number** = is the sum of a whole number and a fraction

Reduce each fraction to its lowest term.

1.  $\frac{21}{35}$

2.  $\frac{27}{63}$

Rename each mixed number as an improper fraction.

3.  $2\frac{2}{7}$

4.  $-8\frac{2}{3}$

Rename each improper fraction as a mixed number.

5.  $-\frac{34}{4}$

6.  $\frac{47}{5}$

Evaluate the following and express as a mixed number, when  $x = 3$  and  $y = -6$ .

7.  $-\frac{119}{x}$

8.  $\frac{x-35}{y}$

### 5.2 Comparing Rational Numbers examples on pages 186-190 (see Chapter 5.2 notes)

- **Tips: Equivalent Fractions** = are fractions representing the same value which can be reduced to the same fraction (lowest term / simplified)
- **Tips: Creating Equivalent Fractions** = to create an equivalent fraction, you can multiply the numerator and denominator by the same number
- **Tips: Comparing Two Fractions** = to compare two fractions, you must create a common denominator (use the LCM of the two denominators)
- **Tips: Cross Multiplication** = is multiplying the numerator of the first fraction by the denominator of the second fraction ( $a \cdot d$ ), then multiplying the denominator of the first fraction by the numerator of the second fraction ( $b \cdot c$ ) **Example:**  $\frac{a}{b} \begin{matrix} \nearrow & \searrow \\ \nearrow & \searrow \\ \nearrow & \searrow \end{matrix} \frac{c}{d}$

Use **common denominators** or **cross multiplication** to compare the following fractions and use  $>$ ,  $<$ , or  $=$ .

9.  $\frac{12}{15} \square \frac{3}{5}$

10.  $\frac{2}{3} \square \frac{27}{40}$

11.  $\frac{11}{15} \square \frac{132}{180}$

12.  $\frac{13}{19} \square \frac{7}{11}$

### 5.3 Decimal Equivalents examples on pages 194-196 (see Chapter 5.3 notes)

- **Tips: Terminating Decimals** = a terminating decimal is a decimal that ends and has a limited number of digits
- **Tips: Repeating Decimals** = a decimal number where certain digits repeat forever, which is expressed as a line over the repeating numbers

Convert the following fractions to decimals.

13.  $-\frac{5}{8}$

14.  $\frac{53}{20}$

15.  $\frac{5}{6}$

Convert the following decimals to fractions or mixed numbers in lowest terms.

16. .125

17. -5.68

18. -.55

#### 5.4 Ratio and Rate examples on pages 198-200 (see Chapter 5.4 notes)

- **Tips:** Ratio = is a comparison of two numbers usually written as a fraction. Example: object #1 (numerator) TO object #2 (denominator)
- **Tips:** Anything after the word “TO” is on the bottom (denominator)
- **Tips:** Rate = is a ratio comparing two different types of measurements
- **Tips:** Unit Rate = is a ratio with the number 1 in the denominator

During a push-up contest Mr. Fite, Mr. Wright, and Mr. Auman did 13, 7, 4 one-handed push-ups. Find the ratios of the one-handed push-ups and express in lowest terms using the word “to.”

19. Fite to Auman                                      20. Auman to Wright                                      21. Wright to Fite
22. Fite to Auman and Wright                      23. Auman to Fite and Wright                      24. Wright to Auman and Fite

Find the unit rate.

25. Paid \$450 for 30 hours of work.              26. Paid \$14 for 4 lbs of ham.                      27. Drove 770 miles on 25 gallons.

#### 5.5 Proportions examples on pages 202-205 (see Chapter 5.5 notes)

- **Tips:** Proportion = when you compare two ratios with the same value
- **Tips:** to setup a proportion, you must compare the same items in the numerator and you must compare the same items in the denominator

Solve the following proportions.

28.  $\frac{5}{9} = \frac{x}{27}$

29.  $\frac{8}{m} = \frac{12}{9}$

30.  $\frac{8}{15} = \frac{72}{n}$

Create a proportion from each word problem and solve.

31. Mr. Iwanaga went to the store and noticed a sale where he could buy 3 oranges for \$0.97, how many oranges can he buy with \$24.25.
32. Mrs. Hicks loves to go on road trips around the United States. If she can travel 108 miles from Tulsa to Oklahoma City in 2 hours, how long will it take her to travel 1242 miles to Gettysburg?

#### Constructed Response Questions:

33. Create a ratio and rate word problem using three characters. Explain each step as you solve the problem (for an example see problems 19-24 above).
34. Create a proportions word problem. Explain each step as you solve the problem (for an example see problems 31-32 above).