Math 7 Practice Problems (1.1-1.3)
Ratios, Rates, Complex Fractions & Dimensional Analysis

Name Key
Block ____ Date ____

No Calculator for # 1-8. You may use a calculator for # 9-16.

1) Simplify

$$\frac{\frac{9}{10}}{\frac{15}{16}} = \frac{9}{10} \div \frac{15}{16}$$

$$= \frac{\overset{3}{\cancel{9}}}{\underset{5}{\cancel{10}}} \cdot \frac{\overset{8}{\cancel{16}}}{\underset{5}{\cancel{15}}}$$

$$= \frac{24}{25}$$

2) Simplify

$$\frac{3\frac{1}{2}}{14} = 3\tfrac{1}{2} \div 14 = \frac{7}{2} \div \frac{14}{1}$$

$$= \frac{\overset{1}{\cancel{7}}}{2} \cdot \frac{1}{\cancel{14}_2}$$

$$= \frac{1}{4}$$

3) Write the word ratio and complex fraction that can be used to solve this problem. Then solve. In $3\frac{1}{4}$ hours, Sara runs 13 miles. Find her average rate of speed in miles per hour.

$$\frac{\text{miles}}{\text{hr.}} \quad \frac{13}{3\frac{1}{4}} = 13 \div 3\tfrac{1}{4} = \frac{13}{1} \div \frac{13}{4}$$

$$= \frac{\cancel{13}}{1} \cdot \frac{4}{\cancel{13}}$$

$$= 4 \text{ miles/hour}$$

4) Write $21\frac{2}{3}\%$ as a fraction in lowest terms.

$$\frac{21\frac{2}{3}}{100} = 21\tfrac{2}{3} \div 100$$

$$\frac{\overset{13}{\cancel{65}}}{3} \cdot \frac{1}{\underset{20}{\cancel{100}}}$$

$$\frac{13}{60}$$

5) Of the 24 students in math class, 15 are boys. What is the ratio of girls to boys? Give ratio in simplest form.

$\frac{\text{girls}}{\text{boys}}$ $\frac{24-15}{15} = \frac{9}{15} = \frac{3}{5}$

6) In $2\frac{1}{2}$ hours, Sara drove 170 miles. Find the unit rate in miles per hour.

$\frac{\text{miles}}{\text{hour}}$ $\frac{170}{2\frac{1}{2}} = 170 \div 2\frac{1}{2}$

$= \frac{170}{1} \div \frac{5}{2}$

$= \frac{34}{\cancel{170}} \cdot \frac{2}{\cancel{5}}$

$= 78$ mi/hr.

7) Write these ratios in simplest form:

A) 18 to 6 $\frac{18}{6}$ $\left(\frac{3}{1}\right)$

B) 12 to 20 $\frac{12}{20}$ $\left(\frac{3}{5}\right)$

C) $\frac{\text{20 in}}{\text{3 ft}}$ $\frac{20 \text{ in}}{36 \text{ in}}$ $\left(\frac{5}{9}\right)$

8) Use this data from a survey of 100 students to decide if the statement is true or false. If false show why it is false.

One out of five students go to sports practice as soon as they get home from school.

What do you do first when you get home from school?

Activity	Number of students
Eat a snack	45
Do homework	10
Watch TV	20
Go to sports practice	25

$\frac{\text{Sports}}{\text{total}}$ $\frac{25}{100} = \frac{1}{4}$

1 out of 4 go to sports

9) A 24 oz bottle of Pam's shampoo costs $3.69. A 38 oz bottle of Pam's shampoo costs $4.59. Which is the better buy based on unit price?

24 oz 38 oz

$\frac{\text{cost}}{\text{oz}}$ $\frac{3.69}{24}$ $\frac{4.59}{38}$

0.15375... 0.1207... Better Buy

$0.15/oz $0.12/oz

10) Jan drove 300 miles in 5 hours, Sue drove 180 miles in 4 hours, and Erika drove 480 miles in 8 hours. If they were all driving at constant speeds, which two girls were driving at the same rate? Explain (show) your reasoning using the concept of unit rate.

	Jan	Sue	Erika
$\frac{\text{mi}}{\text{hour}}$	$\frac{300}{5}$	$\frac{180}{4}$	$\frac{480}{8}$
	60 mi/hr.	45 mi/hr.	60 mi/hr.

Jan + Erika both going 60 mi/hr.

11) There are 36 jolly ranchers in a 24 ounce bag that costs $2.88. Find the cost per jolly rancher.

$\frac{\text{cost}}{\text{j.r.}}$ $\frac{2.88}{36}$ $.08/j.r.

12) A two pound bag of candy costs $4.39. An eighteen ounce bag costs $2.79. Find the <u>better buy based on unit price</u>.

2 lb 18oz

$\frac{\text{cost}}{\text{oz}}$ $\frac{4.39}{2(16oz)}$ $\frac{2.79}{18}$

$\frac{4.39}{32}$ 0.155

Better Buy 0.1371 $0.16/oz

$0.14/oz

13) Which of these trail mix recipes is more "chocolaty" (more chocolate per total ounces)? Explain your reasoning.

Trail Mix A	Trail Mix B
12 oz cheerios	26 oz cheerios
15 oz raisins	14 oz raisins
8 oz M&M's	12 oz M&M's

$\frac{\text{Choc}}{\text{total}}$ $\frac{8}{35}$ $\frac{12}{52}$

0.2285 0.2307

larger

14) Use the process of dimensional analysis to change 3080 feet/min to feet per hour.

$\frac{3080\ ft}{1\ min} \cdot \frac{60\ min}{1\ hr}$ $\left[\frac{ft}{hr}\right]$

3080(60)

184,800 ft/hr.

1 hr = 60 min

15) Use the process of dimensional analysis to convert 45 km/min to meters per second.

$\frac{45\ km}{1\ min} \cdot \frac{1000\ m}{1\ km} \cdot \frac{1\ min}{60\ sec}$ $\left[\frac{m}{sec}\right]$

$\frac{45(1000)}{60} = \frac{45000}{60}$

750 m/sec

1 km = 1000 m

60 sec = 1 min

16) Use the process of dimensional analysis to convert 8 milliliters per minute to Liters per hour.

$\frac{8\ mL}{1\ min} \cdot \frac{1\ L}{1000\ mL} \cdot \frac{60\ min}{1\ hr}$ $\left[\frac{L}{hr}\right]$

$\frac{8(60)}{1000}$

$\frac{480}{1000}$

0.48 L/hr.

1 L = 1000 mL

1 hr = 60 min