

## Chapter 1 Test Study Guide

**Directions: Solve and show all work. Label answers when appropriate!**

1) In an art class, there are 32 pens to 40 brushes. What is the ratio of pens to brushes written as a fraction in simplest form? Explain its meaning.

$$\frac{32 \div 8}{40 \div 8} = \frac{4}{5} \quad \text{For every 4 pens there are 5 brushes.}$$

2) Big Gold has 28 volunteer firefighters and 4 fire trucks. Write the ratio of firefighters to fire trucks in simplest form.

$$\frac{28}{4} = \boxed{\frac{7}{1}}$$

3) On his fruit stand, Mr. Roberts has 13 papayas, 23 star fruits, 35 mangos, and 19 strawberries. Find the ratio of the number of mangos to the total number of pieces of fruit. Then explain its meaning.

$$\frac{35 \div 5}{90 \div 5} = \frac{7}{18} \quad \text{7 out of every 18 pieces of fruit are mangos.}$$

4) Determine if the rates \$168 raised for washing 24 cars and \$280 raised for washing 40 cars are equivalent. Explain your reasoning.

$$\frac{168 \div 24}{24 \div 24} = \frac{\$7}{1 \text{ car}}$$

$$\frac{\$280 \div 40}{40 \div 40} = \frac{\$7}{1 \text{ car}}$$

Yes they are equivalent because both rates are equal to \$7 per car.

5) Kendra and Mark both bought bags of M&Ms at a local store. Kendra discovered that the ratio of blue M&Ms to green M&Ms in her bag was 2:3 while the ratio in Mark's bag was 18:24. Are these ratios equivalent? Explain by showing work.

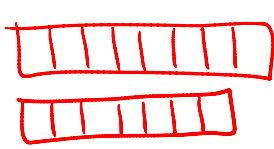
$$\frac{2 \times 9}{3 \times 8} \neq \frac{18}{24} \quad \text{Not equivalent}$$

6) Find two numbers that form a ratio equivalent to 3:8 and have a sum of 66.

①	3	6	9	12	15	18
②	8	16	24	32	40	48
total	11	22	33	44	55	66

18 & 48

7) Divide 180 into two groups that have a ratio of 8:7.



$8 + 7 = 15 \text{ groups}$

$180 \div 15 = 12$

$8 \times 12 = 96$   
 $7 \times 12 = 84$

96 & 84

**Find the unit rate.**

8) 16,500 people in 25 square miles

$$\frac{16,500 \text{ people}}{25 \text{ sq miles}} \div 25 = \frac{660}{1}$$

$$\begin{array}{r} 25 \overline{) 16,500} \\ \underline{150} \phantom{0} \\ 150 \phantom{0} \\ \underline{150} \phantom{0} \\ 0 \end{array}$$

660 people per sq. mile

9) 15 chocolate bars for 20 kids

$$\frac{15 \text{ bars}}{20 \text{ kids}} \div 5 = \frac{3}{4} \div 4 = \frac{3}{16}$$

$\frac{3}{4}$  Chocolate bar per kid

10) A mouse can travel 12 meters in 28 seconds. At this rate, how many meters is it traveling per second?

$$\frac{12 \text{ m} \div 4}{28 \text{ s} \div 4} = \frac{3 \text{ m} \div 7}{7 \text{ s} \div 7} = \frac{\frac{3}{7} \text{ m}}{1 \text{ second}} \text{ or } \frac{3}{7} \text{ meter per second}$$

11) Which of the following rates is equal to the unit rate of 75 miles in 6 hours? *Circle all that apply.*

- A) 200 miles in 15 hours    B) 150 miles in 8 hours    C) 125 miles in 10 hours    D) 225 miles in 18 hours

$$\frac{200 \text{ mi} \div 15}{15 \text{ h} \div 15} = \frac{13\frac{1}{3} \text{ mi}}{1 \text{ h}}$$

$$\frac{150 \text{ mi} \div 8}{8 \text{ h} \div 8} = \frac{18.75 \text{ mi}}{1 \text{ h}}$$

$$\frac{125 \text{ mi} \div 10}{10 \text{ h} \div 10} = \frac{12.5 \text{ mi}}{1 \text{ h}}$$

$$\frac{225 \text{ mi} \div 18}{18 \text{ h} \div 18} = \frac{12.5 \text{ mi}}{1 \text{ h}}$$

$$75 \div 6 = 12.5 \text{ mph}$$

12) Which size of yogurt shown in the table has the lowest unit price? Round to the nearest cent if necessary.

Size (oz)	Cost (\$)
6	0.84
8	1.04
10	1.29
32	4.48

$$6 \overline{) 0.84} \begin{array}{r} .14 \\ -6 \\ \hline 24 \\ -24 \\ \hline 0 \end{array}$$

$$8 \overline{) 1.04} \begin{array}{r} .13 \\ -8 \\ \hline 24 \\ -24 \\ \hline 0 \end{array}$$

$$10 \overline{) 1.29} \begin{array}{r} .129 \\ -10 \\ \hline 29 \\ -20 \\ \hline 90 \\ -90 \\ \hline 0 \end{array}$$

$$32 \overline{) 4.48} \begin{array}{r} .14 \\ -32 \\ \hline 128 \\ -128 \\ \hline 0 \end{array}$$

$$0.129 < 0.13 < 0.14$$

$0.129$   
 $\approx 0.13$

13) The jumping team can jump 36 times in 9 seconds. At this rate, how many jumps can they make in 27 seconds?

<b>Jumps</b>	36	108
<b>Time (s)</b>	9	27

108 jumps

14) Daurie rides on her motorcycle for 252 miles on 6 gallons of gas. At this rate, how far will she get on 2 gallons of gas?

<b>Distance (mi)</b>	252	84
<b>Gasoline (gal)</b>	6	2

$$3 \overline{) 252} \begin{array}{r} \times 84 \\ -24 \\ \hline 12 \\ -12 \\ \hline 0 \end{array}$$

84 miles

15) A customer at a raceway can drive around the track 54 times for \$12. At this rate, how many times can the customer drive around the track for \$8?

Number of Times Around Track	54	18	36
Cost (\$)	12	4	8

36 times

16) Ms. Sims traveled to 42 countries in 60 days. At this rate, how many countries would she travel to in 40 days?

Countries	42	14	28
Days	60	20	40

28 countries

17) Four gel pens cost \$6 at CVS. How much would it cost to buy 21 gel pens?

① Ratio Table

\$6	126	31.5
4	84	21

$126 \div 4 = \$31.50$

② Equivalent Fractions

$$\frac{\$6 \div 2}{4 \div 2} = \frac{?}{21}$$

$$\downarrow$$

$$\frac{\$3 \times 10.5}{2 \times 10.5} = \frac{\$31.50}{21}$$

③ Unit Rates

$$\frac{\$6}{4 \text{ pens}} = \frac{\$1.50}{1 \text{ pen}} \text{ or } \$1.50 \text{ per pen}$$

$$1.50 \times 21 = \$31.50$$

18) A stationery store is selling 6 notebooks for \$10. How much would 9 notebooks cost?

Notebooks	6	3	9
Cost (\$)	10	5	15

\$15

$$\frac{\$10}{6} = \frac{?}{9}$$

$$\downarrow$$

$$\frac{\$5 \times 3}{3 \times 3} = \frac{\$15}{9}$$

19) There are 207 students in the 9 classes at East Middle School. At this rate, how many students are in 6 classes?

$$\frac{207s \div 9}{9c \div 9} = \frac{23s}{1c} \quad 23 \times 6 = \boxed{138 \text{ students}}$$

20) At a local restaurant, 42 ounces of the soup du jour will serve 8 people. At this rate, how many ounces will be needed to serve 12 people?

$$\frac{42 \text{ oz} \div 2}{8 \text{ people} \div 2} = \frac{21 \text{ oz} \times 3}{4 \text{ people} \times 3} = \frac{63 \text{ oz}}{12 \text{ people}} \quad \boxed{63 \text{ oz}}$$

21) Stew Dent found that he blinked 85 times in 15 minutes. At this rate, how many minutes did it take him to blink 34 times? (Hint: You may want to use equivalent fractions...)

$$\frac{85 \text{ blinks} \div 5}{15 \text{ min} \div 5} = \frac{34 \text{ blinks}}{?}$$

$$\frac{17 \text{ blinks} \times 2}{3 \text{ min} \times 2} = \frac{34 \text{ blinks}}{?}$$

$\boxed{6 \text{ minutes}}$

22) The ratio of salt to water in a certain solution is 4 to 15. If the solution contains 6 ounces of water, how many ounces of salt does it contain? (Hint: You may want to use a ratio table...)

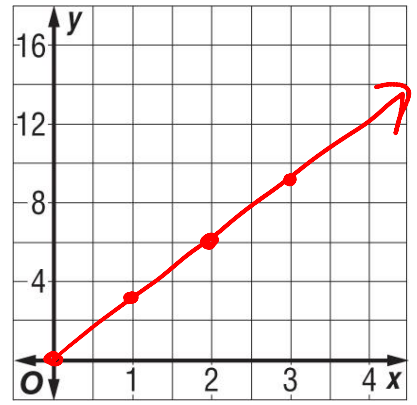
Salt	4	8	1.6
Water	15	30	6

$\frac{8}{5} = 1\frac{3}{5} = 1.6$

$\boxed{1.6 \text{ oz salt}}$

**FOOTBALL** In football, each field goal made scores 3 points. The table shows this relationship.

Field Goals Made ( $x$ )	Total Points ( $y$ )
0	0
1	3
2	6
3	9



23) List this information as ordered pairs (field goals made, total points).

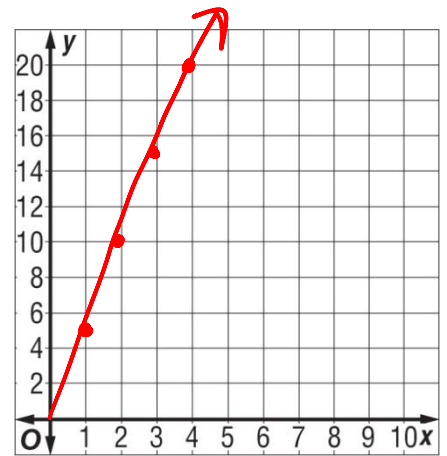
$(0,0)$   $(1,3)$   $(2,6)$   $(3,9)$

24) Graph the ordered pairs. Then describe the graph and relationship it shows.

Each field goal increases the total points by 3 points. The graph is a straight line.

**EXERCISE** The table shows the time it takes Bernard to jog 1, 2, 3, and 4 laps around the track.

Number of Times Around Track	Total Time (min)
1	5
2	10
3	15
4	20



25) List this information as ordered pairs (number of times around track, total time).

$(1,5)$   $(2,10)$   $(3,15)$   $(4,20)$

26) Graph the ordered pairs. Then describe the graph and relationship it shows.

Each lap takes Bernard 5 min to complete. The graph is a straight line and is relatively steep.