

Warm Up Grade 8

April 4, 2017



1) In the NHL, the ratio of shots taken to the goals scored by an all-star player is 9:2. The player has a 50-goal season. How many shots did he take?

$$\begin{array}{l} \text{Taken : goals} \\ 9 : 2 \\ \times 25 \quad \left. \begin{array}{l} \\ \end{array} \right\} \times 25 \\ \hline 225 : 50 \end{array}$$

The player takes 225 shots.

2) The scale on a map of Manitoba is 1 : 5 000 000. This means 1 cm on the map represents 5 000 000 cm actual distance. The map distance between two towns is 3.4 cm. What is the actual distance between the two towns?

$$\begin{array}{l} \text{Map : Actual} \\ 1 \text{ cm} : 5\,000\,000 \text{ cm} \\ \times 3.4 \quad \left. \begin{array}{l} \\ \end{array} \right\} \times 3.4 \\ \hline 3.4 \text{ cm} : 17\,000\,000 \text{ cm} \\ \hline \text{The actual distance is} \\ 17\,000\,000 \text{ cm} \\ 17\,000 \text{ m} \\ 170 \text{ km} \end{array}$$



Extra Practice 8

$$1. a) x:8 = 9:24$$

$\div 3 \quad \div 3$

$$x = 3$$

$$b) y:15 = 7:3$$

$\times 5 \quad \times 5$

$$y = 35$$

$$c) a:8 = 9:4$$

$\times 2 \quad \times 2$

$$a = 18$$

$$d) p:12 = 15:10$$

$$p:12 = 3:2$$

$\times 6 \quad \times 6$

$$p = 18$$

$$e) b:5 = 18:6$$

$$= 9:3$$

$$b:5 = 3:1$$

$\times 5 \quad \times 5$

$$b = 15$$

$$f) t:11 = 6:33$$

$\div 3 \quad \div 3$

$$t = 2$$

$$g) 2:7 = 20:d$$

$\times 10 \quad \times 10$

$$d = 70$$

$$h) 34:85 = f:5$$

$\div 17 \quad \div 17$

$$f = 2$$

$$i) 45:30 = 6:s$$

$\div 5 \quad \div 5$

$$9:6 = 6: \underline{\quad}$$

$$3:2 = 6: \underline{4}$$

$$s = 4$$

$$j) 9:36 = c:8$$

$\div 3 \quad \div 3$

$$3:12 = \underline{\quad}:8$$

$$1:4 = 2:8$$

$\times 2 \quad \times 2$

$$c = 2$$

2. Preferred X to Interviewed = P : I

$$\begin{array}{ccc} 7 : 8 = \underline{\quad} : 216 \\ \times 27 \quad \times 27 & & \\ & & 189 \end{array}$$

189 people preferred Brand X

3. Attended : Total = A : T

$$\begin{array}{ccc} 4 : 7 = a : 112 \\ \times 16 \quad \times 16 & & \\ & & a = 64 \end{array}$$

64 students attended the dance

4. Boards : Skis = Boards : Skis

$$\begin{array}{ccc} 5 : 3 = b : 126 \\ \times 42 \quad \times 42 & & \\ & & b = 210 \end{array}$$

210 snowboards were rented

$$5. \text{ Blueprint: actual} = B : a$$

$$1 : 40 = \underline{\quad} : 3.4$$

$\xrightarrow{\div 40} \quad \xrightarrow{\div 40}$

$$0.025 : 1 = \underline{0.085} : 3.4$$

$\times 3.4 \quad \times 3.4$

$$\text{Blueprint: actual} = B : a$$

$$1 : 40 = \underline{\quad} : 4.8$$

$$0.025 : 1 = \underline{0.12} : 4.8$$

$\times 4.8 \quad \times 4.8$

The room on the blueprint would be
 0.085 : 0.12 or 8.5cm by 12cm

$$b. \text{ length : width} = \text{length : width}$$

$$5 : 3 = \underline{\quad} : 45$$

$\times 15 \quad \times 15 \quad \quad \quad 75$

The length of the painting is 75cm

$$7. a) \text{trumpet} : \text{clarinet} = t : c$$

$$6 : 5 = \underline{\quad} : 10$$

$\times 2$ $\times 2$ $\times 2$

12 students take trumpet

$$b) \text{pian} : \text{trumpet} = p : t$$

$$8 : 3 = \underline{\quad} : 12$$

$\div 4$ $\times 4$ $\times 4$

32 students take piano

$$8. \text{map} : \text{actual} = \text{map} : \text{actual}$$

$$1 : 40 = \underline{\quad} : 340$$

$$0,5 : 20 = \underline{\quad} : 340$$

$\times 17$ $\times 17$ $\times 17$

On the map, the distance is 8.5cm.

Rates and Ratios



A ratio is a comparison between two things.

Rate is the relationship between two different units of measurement, such as meters and seconds, or dollars and hours.

A unit rate is when the second term in the ratio is always 1.

Rates are often written using a slash / which means per.

Ex: km/hr means kilometers per hour

beats/min means heartbeats per minute

\$/hr mean the amount of money per hour

The slash (/) or term per means for every one.

Canadian speed skater Jeremy Wotherspoon, of Red Deer, Alberta, set the world record for the 500 m at the 2004 World Cup in Italy. He skated at an average speed of 14.44 m/s. The white-tailed deer can run at speeds of up to 30 km/h.

Who is faster? How can you find out?

watch units
what is this in m/s?

Remember 1 km = 1000 m
1 hr = $\overset{\times 60}{60}$ min = $\overset{\times 60}{3600}$ sec

Deer

$$\frac{30 \text{ km}}{1 \text{ hr}} \xrightarrow{\times 1000} = \frac{30\,000 \text{ m}}{60 \text{ min}}$$

$$\xrightarrow{\times 60} = \frac{30\,000 \text{ m}}{3600 \text{ Sec}} \quad \begin{array}{l} \div 3600 \\ \div 3600 \end{array}$$

$$= \frac{8.\bar{3} \text{ m}}{1 \text{ sec}}$$

Skater = 14.4 m / 1 sec

Skater is going faster



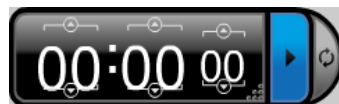
Speed skater
14.4 m/s

1 hr
→ 60 min × 60 sec
3600 s

The speed skater
is faster

Deer
30 km
hr

30 000 m
3600 sec
8.3 m/sec



When we compare two things with different units, we have **rate**.

Here are some rates:

- We need 5 sandwiches for every 2 people.
- Oranges are on sale for \$1.49 for 12.
- Gina earns \$4.75 per hour for baby-sitting.
- There are 500 sheets on one roll of paper towels.

The last two rates are **unit rates**.

Unit Rate compares a quantity to 1 unit.

*Rates cannot be expressed as percents since they compare two different quantities.

Part a) Express each unit rate using symbols.

1. Serena walks 4 km in 1 hr. 4 km/hr
2. Sanjit reads 3 books in 1 week. 3 books/week
3. The tap drips 25 drops in 1 min.
 25 drops/min

Part b) Express as a unit rate.

1. Betty drives her car 150 km in 2 h.
 $\div 2 \left(\frac{150 \text{ km}}{2 \text{ hr}} \right) \div 2$
 75 km/hr
2. The helicopter travels 180 km in 3 h.
 $\div 3 \left(\frac{180 \text{ km}}{3 \text{ h}} \right) \div 3$
 60 km/hr

Which sentences are ratios? Which sentences are rates?
How do you know?

1. The cost of pecans is \$10.89 for each kilogram. $\$/\text{kg}$ Rate
2. Three out of every seven people are wearing glasses. Ratio $\frac{\text{people wear glasses}}{\text{total people}}$
3. Mr. Thompson travelled 620 km in 6 h. km/h Rate
4. Each block of a quilt has 5 red patches, 4 yellow patches, and 6 blue patches. $\text{Patch / Patches / Patches}$ Ratio
5. In 7 games, the team scored a total of 23 points.

$\text{games} \div \text{Points}$

Ratio ?

Rate ?

Maria charged \$15 for 3 h of babysitting.

- What is Maria's rate per hour?
- How much does Maria charge for 5 h of babysitting?
- How many hours does Maria have to babysit to earn \$50?

$$a) \quad \begin{array}{l} \$15 / 3hr \\ \div 3 \quad \downarrow \quad \div 3 \\ \$5 / 1hr \end{array}$$

Maria's rate per hour is \$5

$$b) \quad \begin{array}{l} \$5 / hr \\ \times 5 \quad \downarrow \quad \times 5 \\ \$25 / 5hr \end{array}$$

She charges \$25 for 5 hr of work

$$c) \quad \begin{array}{l} \$5 / hr \\ \times 10 \quad \downarrow \quad \times 10 \\ \$50 / \boxed{10hr} \end{array}$$

She has to work 10 hr to get \$50

Class/Homework

5a) $\frac{\$399}{3 \text{ weeks}}$
 $\frac{\$133}{1 \text{ week}}$

6a) $1 \text{ L} = 1000 \text{ mL}$

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#5, #6, #7, #8, #11a, #12, #13

Test

Friday 7
Thursday April 6 on Unit 5 Percents, Ratios and Rates

To find unit rates, we can use diagrams, tables, and graphs.

A printing press prints 120 sheets in 3 min.

- a) Express the printing as a unit rate. (diagram)
- b) How many sheets are printed in 1 h?

Use the data in Example 1.
 How long will it take to print 1000 sheets?

Time (min)	5	10	15	20	25
Sheets Printed					

