



Warm Up Grade 8

April 11 2019



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?

Shots : Goals
 $9 : 2$
 $\times 25 \rightarrow 225 : 50$

He took 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?

Map : Real
 $1 : 5\,000\,000$
 $\times 3.4 \rightarrow 3.4 : 17\,000\,000$
 Map : 3.4 cm
 Real : 170 km



Extra Practice 8

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

$\div 3 \quad \div 3$

$$x = 3$$

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

$\times 5 \quad \times 5$

$$y = 35$$

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

$\times 2 \quad \times 2$

$$a = 18$$

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

$$p:12 = 3:2$$

$\times 6 \quad \times 6$

$$p = 18$$

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

$$= 9:3$$

$$b:5 = 3:1$$

$\times 5 \quad \times 5$

$$b = 15$$

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

$\div 3 \quad \div 3$

$$t = 2$$

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

$\times 10 \quad \times 10$

$$d = 70$$

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

$\div 17 \quad \div 17$

$$f = 2$$

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

$\div 5 \quad \div 5$

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

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

$\times 2 \quad \times 2$

$$s = 4$$

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

$\div 3 \quad \div 3$

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

$$1:4 = 2:8$$

$\times 2 \quad \times 2$

$$c = 2$$

2. Preferred X to Interviewed = P : I

$$\underset{\times 27}{7} : \underset{\times 27}{8} = \underline{\quad} : 216$$

189

189 people preferred Brand X

3. Attended : Total = A : T

$$\underset{\times 16}{4} : \underset{\times 16}{7} = a : 112$$

$$a = 64$$

64 students attended the dance

Attend : Total
Student : Total

$$\begin{matrix} \times 16 \downarrow & 4 & : & 72 \times 16 \\ & \square & : & 112 \end{matrix}$$

4. Boards : Skis = Boards : Skis

$$\underset{\times 42}{5} : \underset{\times 42}{3} = b : 126$$

$$b = 210$$

210 snowboards were rented

Boards : Skis

$$\begin{matrix} \times 42 \downarrow & 5 & : & 3 \times 42 \\ & 210 & : & 126 \end{matrix}$$

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

$$1 : 40 = _ : 3.4$$

$$\begin{array}{cc} \nearrow 40 & \div 40 \end{array}$$

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

$$\begin{array}{cc} \times 3.4 & \times 3.4 \end{array}$$

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

$$1 : 40 = _ : 4.8$$

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

$$\begin{array}{cc} \times 4.8 & \times 4.8 \end{array}$$

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

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

$$5 : 3 = _ : 45$$

$$\begin{array}{cc} \times 15 & \times 15 \end{array} \quad \begin{array}{c} 75 \\ \end{array}$$

The length of the painting is 75cm

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

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

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

12 students take trumpet

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

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

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

32 students take piano

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

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

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

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

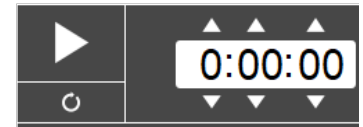
On the map, the distance is 8.5cm.

a) T : C
x2 6 : 5 x2
Actual 12 : 10

P : T
8 : 3 \downarrow x4 Ratio
 \square 12 Act
32
32 piano player

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.

$\$ / \text{hr}$ $\$ / \text{min}$

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. m/sec
The white-tailed deer can run at speeds of up to 30 km/h.

Who is faster? How can you find out?

Remember 1 km = 1000 m

$$1 \text{ hr} = \underline{60} \text{ min} = \underline{3600} \text{ sec}$$

$$1 \text{ km} = 1000 \text{ m}$$

$$30 \text{ km} = 30\,000 \text{ m}$$

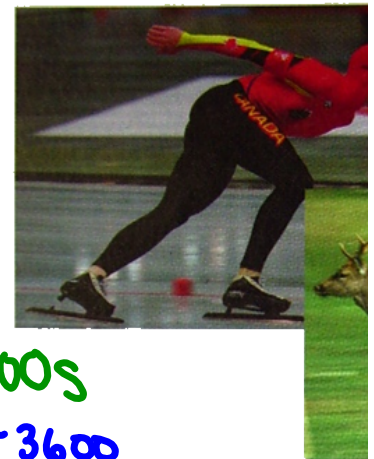
$$1 \text{ h} = 3600 \text{ s}$$

$$\text{Deer: } 30 \text{ km/h} = \frac{30\,000 \text{ m}}{\div 3600} / \frac{3600 \text{ s}}{\div 3600}$$

$$8.\bar{3} \text{ m} / \text{sec}$$

Skater 14.4 m/sec
faster

watch units
what is this in m/s?



Speedskater
14.4 m/s

1 hr
→ 60 min × 60 sec
3600 s

The speedskater
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 a **rate**.

Here are some rates:

$$\begin{array}{l} \swarrow \downarrow \quad 5 \text{ sand} / 2 \text{ people} \quad \searrow \div 2 \\ \quad \quad \quad 2.5 \text{ sand} / 1 \text{ person} \end{array}$$

- 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

✓ symbol

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.

150 km / 2 hr
 $\div 2$ \rightarrow 75 km / 1 hr $\leftarrow \div 2$

2. The helicopter travels 180 km in 3 h.

180 km / 3 hr
 $\div 3$ \rightarrow 60 km / 1 hr $\leftarrow \div 3$

Maria charged \$15 for 3 h of babysitting.

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

Class/Homework

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#5, #6, ~~#7~~, #8, #11a, ~~#12~~, ~~#13~~
a
b
c
d
a
b
a
b

Test

Tuesday April 16 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					

