

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

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

$$1 : 40 = _ : 3.4$$

$$\begin{array}{cc} \nearrow +0 & \div 40 \end{array}$$

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

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

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

$$1 : 40 = _ : 4.8$$

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

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

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

$$6. \text{ length : width} = \text{length : width}$$

$$5 : 3 = _ : 45$$

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

The length of the painting is 75cm

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

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

$\begin{array}{ccc} \times 2 & \times 2 & \\ \hline & & 12 \end{array}$

12 students take trumpet

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

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

$\begin{array}{ccc} +4 & \times 4 & \\ \hline & & 32 \end{array}$

32 students take piano

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

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

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

$\begin{array}{ccc} \times 17 & \times 17 & \\ \hline & & 8,5 \end{array}$

On the map, the distance is 8.5 cm.

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

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

$$1 \text{ min} = 60 \text{ sec}$$

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



$$\begin{array}{r} \text{Jeremy} \\ 14.4 \text{ m} \\ \hline 1 \text{ Sec} \end{array}$$

$$\begin{array}{r} \text{Deer} \\ 30 \text{ km} \xrightarrow{\text{change to meters}} 30\,000 \text{ m} \\ \hline 1 \text{ hr} \quad 3600 \text{ sec} \end{array}$$

$$= \frac{8.3 \text{ m}}{1 \text{ sec}}$$

$$= 8.3 \text{ m/s}$$

$$14.4 \text{ m/s}$$

Jeremy is faster

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 **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/h
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. (2^{nd} term needs to be 1)

1. Betty drives her car 150 km in 2 h.

$$\begin{array}{r} \div 2 \quad \quad \div 2 \\ 75 \text{ km/h} \end{array}$$

2. The helicopter travels 180 km in 3 h.

$$\begin{array}{r} \div 3 \quad \quad \div 3 \\ 60 \text{ km/h} \end{array}$$

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. $\text{people} : \text{people}$ Ratio
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. Ratio
5. In 7 games, the team scored a total of 23 points.

Maria charged \$15 for 3 h of babysitting.

$$E = 5 \times h$$

how much you earn # of hours work

- 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?

$$\begin{array}{l} \text{a) } \$15 / 3h \\ \quad \div 3 \quad \div 3 \\ \quad \quad \quad \$5/h \end{array}$$

$$\begin{array}{l} \text{b) } \text{work } 5h \\ \quad * 5 \times h \\ \quad \quad 5 \times 5 \\ \quad \quad \quad \$25 \end{array}$$

$$\begin{array}{l} \text{c) } \$50 \div 5 \\ \quad \quad \quad 10 \text{ hours} \end{array}$$

$$\begin{array}{l} 50 = 5 \times h \\ 50 = \frac{5 \times h}{5} \\ \frac{50}{5} = \frac{5 \times h}{5} \\ \boxed{10 = h} \end{array}$$

Class/Homework

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

Test

Wednesday, 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					

