

Warm-Up

1. $150 \div 5$

2. $500 - 297$

3. 10% of a number is 20.
What is the number?

4) $\frac{1}{4}$ of 480
like \div by 4
 $480 \div 4$
 $= 120$

5) 15% of 70
 \Rightarrow $\left\{ \begin{array}{l} 10\% \text{ of } 70 = 7 \\ 5\% \text{ of } 70 = 3.5 \end{array} \right\} \div$
 $15\% \text{ of } 70 = \mathbf{10.5}$ $\leftarrow 7 + 3.5$

Grade 8 Unit 5: Percents, Ratios, & Rates

Tax

Amount of Sales Tax: 13% in NB
 $0.13 \times \text{Price}$

Price including tax = Amount of Tax + Price

Discount

Amount of Discount: % discount change to decimal
Decimal \times Price

Sales Price = Price - Amount Discounted

Ex) **$\$12.89$**

- 1) Find the amount of tax.
- 2) Find the total cost with tax

1) Sales tax = $13\% \times \text{Price}$
 $= 0.13 \times 12.89$
 $= \$1.68$

2) Price with tax
 $= \text{tax} + \text{Price}$
 $= 1.68 + 12.89$
 $= \mathbf{\$14.57}$

Ex2 a) An item cost \$71, find the discount if you save 30%.

b) What is the sales price

1a) Discount = 30% of Price
(Save)
 0.30×71
 $\mathbf{\$21.30}$

b) Sales Price = Orig Price - dis
 $= 71 - 21.30$
 $= \mathbf{\$49.70}$

Percent Decrease (%) = $\frac{\text{Decrease}}{\text{Original Amount}} \times 100$

Percent Increase (%) = $\frac{\text{Increase}}{\text{Original Amount}} \times 100$

Part-to-whole ratio
ex) Boys: students in class

Part to Part Ratio ex) Boys: Girls

Equivalent Ratio Ex) 16 : 12 multiply or divide both terms by the same number
8 : 6
4 : 3

Proportion
divide 600 km : 7.5 cm 600/280 = 2.14 Same being compared. (distance to Distance)
by 2.14 280 km : x What you do to one side you must do to the other

Rate
Different units compared ex) 2 apples for \$5
apples to \$ Find unit rate (1 apple \$2.50 then use this to compare)

Probability $\frac{\text{\# of favorable outcome}}{\text{total \# outcomes}}$ Fractions, decimal, percents

$P(A \text{ and } B) = P(A) \times P(B)$

$P(\text{Green and Blue}) = P(G) \times P(B)$
 $= \frac{1}{10} \times \frac{1}{10}$
 $= \frac{1}{100}$
 $= 0.01$
 $= 1\%$

Marbles

R R R
G G B
B B B B

$P(\text{Blue}) = \frac{\text{\# Blue}}{\text{Total Marbles}}$

$= \frac{5}{10}$
 $= \frac{1}{2}$
 $= 50\%$
 $= 0.50$

$P(\text{4 marbles Red})$

$P(R) \times P(R) \times P(R) \times P(R)$
 $\frac{3}{10} \times \frac{3}{10} \times \frac{3}{10} \times \frac{3}{10}$
 $\frac{81}{10000}$

$P(\text{Not Blue}) = \frac{\text{Not Blue}}{\text{Total}}$
 $= \frac{5}{10}$
 $= 50\%$
 $= 0.50$

a) $3 : 8$
 $\times 5$
 $x : 40$
 15

b) $4 : 12$
 $\times 3$
 $1 : 3$
 $\times 7$
 $x : 21$
 Redu

$\times 1.75$ $4 : 12$ $\times 1.75$ $\leftarrow \frac{21}{12}$
 $x : 21$

Superstar basketball sneakers which regularly sell for \$185 were marked down by 25%. To further improve sales, the discount was reduced by another 15%. What was the final selling price? Explain why this is not the same as a 40% discount. What would the difference be?

Discount 1

25% of 185
like $\frac{1}{4}$ of 185.

\$46.25

Sales Price = $185 - 46.25$
\$138.75

Discount

$138.75 \times 15\%$
 138.75×0.15
= 20.81

$138.75 - 20.81$
\$117.94

Not the same

40% of 185 = 74
 $185 - 74 = 111$

About 0.6% of New Brunswick's population lives in Sackville. The population of New Brunswick is about 750 000. What is the population of Sackville?

If the population in Sackville increases by 1000 when students attend Mount Allison University, what percent increase would this be?

1) 0.6% of NB
0.6% \times 750 000
* \downarrow change to dec
0.006 \times 750 000
4500

2) % inc = $\frac{1000 \text{ Diff}}{4500 \text{ orig}}$
= 0.22
= 22%
Increase

Write a part:part:whole ratio for each situation:

a) A bag contains 3 jujubes and 5 lollipops

$$\begin{array}{l} J : L : W \\ 3 : 5 : 8 \\ 15 : 25 : 40 \end{array} \left. \begin{array}{l} \\ \\ \end{array} \right\} \times 5$$

b) In the parking lot there are two types of vehicles, cars and trucks. There are 30 vehicles in total and seven of them are trucks.

$$\begin{array}{l} C : T : V \\ 23 : 7 : 30 \end{array}$$

The ratio of boys to girls on the "green team" is 2:3.
Which must be true?

$$\begin{array}{l} b : g \\ 6 : 9 \\ T \\ 5 \end{array}$$

- a) There are 3 times as many girls as boys.
- b) There are twice as many boys as girls.
- c) The number of people on the team is a multiple of 3.
- d) The number of people on the team is a multiple of 5.

Find the actual distance between two cities if the distance measured on the map is 6 cm, and 4 cm on the map represents a distance of 2400 km.

What would that distance be on a map if the scale was 1:1 000 000?

$$\begin{array}{l} \div 4 \left(\begin{array}{l} 4 \text{ cm} \\ 1 \text{ cm} \end{array} \right) : \begin{array}{l} 2400 \text{ km} \\ 600 \text{ km} \end{array} \div 4 \\ \times 6 \left(\begin{array}{l} 6 \text{ cm} \\ \end{array} \right) : \begin{array}{l} x \\ 3600 \text{ km} \end{array} \times 6 \end{array}$$

A recipe used 500 mL of flour for every 125 mL of sugar.
How much flour would be needed if 500 mL of sugar was used?

$$\begin{array}{l} f = S \\ \times 4 \left(\begin{array}{l} 500 \text{ mL} \\ x \\ 2000 \text{ mL} \end{array} \right) : \begin{array}{l} 125 \text{ mL} \\ 500 \text{ mL} \end{array} \times 4 \end{array}$$

Determine who would get the bigger portion of pizza if nine girls share 4 pepperoni pizzas while 7 boys share 3 vegetarian pizzas.

Explain your reasoning. What assumptions are you making?

$$\frac{4 \text{ pizza}}{9 \text{ girls}} = 0.44 \frac{\text{pieces}}{\text{girl}}$$

$$\frac{3 \text{ pizza}}{7 \text{ boys}} = 0.42 \frac{\text{pieces}}{\text{boy}}$$

$$\frac{12 \text{ pizza}}{27 \text{ girl}} \quad \text{Bigger}$$

$$\frac{12 \text{ pizza}}{28 \text{ boys}}$$

$$\frac{28 \text{ pizza}}{63 \text{ girls}}$$

$$\frac{27 \text{ pizza}}{63 \text{ boys}}$$

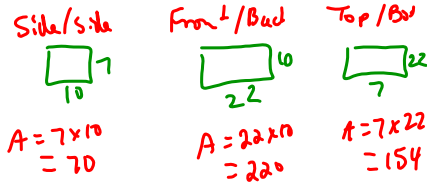
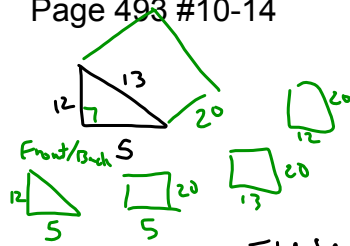
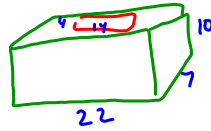
During a heavy rainstorm, 40 mm of rain fell in 30 minutes.
How much rain would you expect to fall in one hour?
In three hours?

What assumptions are you making?

$$\begin{array}{l} 40 \text{ mm} / 30 \text{ min} \\ \times 2 \quad \downarrow \quad \times 2 \\ 80 \text{ mm} / 1 \text{ hour} \\ \quad \quad \quad (60 \text{ min}) \end{array}$$

Review Questions

Page 378 #8-10
 Page 379 #11-13
 Page 493 #10-14



$$\begin{aligned} \text{Total SA} &= 2S_{side} + 2F_{ront} + 2T_{op} \\ &= 2(70) + 2(220) + 2(154) \\ &= 140 + 440 + 308 \\ &= 888 \text{ cm}^2 \end{aligned}$$



$$\begin{aligned} A &= 4 \times 14 \\ &= 56 \text{ cm} \end{aligned}$$

$$\begin{aligned} \text{Box} - \text{hole} \\ 888 - 56 \\ 832 \text{ cm}^2 \end{aligned}$$