

# MATH 10 Workplace

Unit 1: Learning Guides 1, 2, 3 & 4

## WORKING WITH MONEY

### LEARNING OUTCOMES:



- 1) Learn how to determine which purchase is the best buy, considering quality and quantity as well as unit price.
- 2) Investigate sales promotion and compare their effects.
- 3) Convert Canadian dollars into a foreign currency and foreign currencies into Canadian dollars

### COMPLETING THIS GUIDE:

#### ACTIVITIES:



- Assignment 1 – Simplifying Fractions.
- Assignment 2 – Proportional Reasoning.
- Assignment 3 – Working with Ratio.
- Assignment 4 – Working with Proportion
- Assignment 5 – More Working with Proportion.
- Assignment 6 – Calculating Unit Price.
- Assignment 7 – Working with Unit Price.
- Assignment 8 – More Working with Unit Price.
- Assessment Quiz #1
- Assignment 9 – Working with Unit Rate.
- Assignment 10 – Review – Decimals and Percents.
- Assignment 11 – More Decimals and Percents.
- Assignment 12 – Price Markups.
- Assignment 13 – Taxes.
- Assignment 14 – Discounts.
- Assignment 15 – Sale Prices.
- Assignment 16 – Special Sale Prices.
- Assessment Quiz #2
- Assignment 17 – Currency Exchange Rates.
- Assignment 18 – More Currency Exchange Rates.
- Unit 1 Test.

## **Vocabulary: Unit 1**

buying rate (currency)

currency

exchange rate

markup

percent

promotions

proportion

rate

ratio

selling rate (currency)

unit price

unit rate

## REVIEW – SIMPLIFYING FRACTIONS

To simplify a fraction, divide the numerator and denominator by the same number called a **common factor**. Easy common factors to start with are 2 for even numbers, 3, or 5. If the fraction that is the answer cannot be divided by any other common factor (Solution A, below), then it is in **lowest terms** or **simplest form**. If it can be divided again by another common factor (Solution B, below), keep repeating this process until it is in lowest terms.

Example 1: Simplify  $\frac{18}{27}$  ← numerator  
← denominator

Solution A:  $\frac{18}{27} \div 9 = \frac{2}{3}$       Simplify, using a factor of 9

Solution B:  $\frac{18}{27} \div 3 = \frac{6}{9} \div 3 = \frac{2}{3}$       Simplify, using a factor of 3, twice

## ASSIGNMENT 1 – SIMPLIFYING FRACTIONS

1) Simplify these fractions to their lowest terms. Show your work!

a)  $\frac{4}{16}$

b)  $\frac{3}{12}$

c)  $\frac{25}{75}$

d)  $\frac{15}{21}$

e)  $\frac{8}{18}$

f)  $\frac{45}{100}$

g)  $\frac{20}{50}$

h)  $\frac{3}{21}$

i)  $\frac{7}{56}$

## PROPORTIONAL REASONING

A **ratio** is a comparison between two numbers measured in the same units.

A ratio can be expressed in three ways as shown below:

as a fraction  $\frac{9}{16}$

in words by using the word "to" **9 to 16**

a notation using colon : **9 : 16**

Ratios, like fractions, can be simplified. For example, the ratio **150 : 15** can also be expressed

$$\frac{150}{15}$$

which can be simplified  $\frac{150}{15} \div 15 = \frac{10}{1}$   
 $15 \div 15 = 1$

Notice that the numerator of the fraction is larger than the denominator. This can be common with ratios.

If two ratios are equivalent (equal), the first (top) number of each ratio compares to the second (bottom) number in an identical manner. You can represent this equivalence in the two ratios shown here:

$$\frac{150}{15} = \frac{10}{1}$$

An equation showing equivalent ratios is called a **proportion**.

### Cross Multiply and Divide

When two fractions are equal to each other, any unknown numerator or denominator can be found. The following example shows the process.

Example 1: Solve for  $x$  when  $\frac{x}{3} = \frac{2.1}{4}$

Solution: Cross multiply means multiply the numbers across the equals sign (the arrow). The divide part means divide that result by the number opposite the unknown ( $x$ ) as shown below.

$$\frac{x}{3} \xrightarrow{2.1} \frac{2.1}{4}$$

This gives the result  $x = 3 \times 2.1 \div 4$

In other words, if  $\frac{x}{3} = \frac{2.1}{4}$ , then  $x = 3 \times 2.1 \div 4 = 1.575$

It does not matter where the unknown ( $x$ ) is in the proportion, This process works for all situations.

This process can also be used when one side of the equal sign is not in fraction form.

Example 2: Find  $x$  when  $27 = \frac{x}{3}$

Solution:

Step 1. The number 27 is the same as  $\frac{27}{1}$ . So, place a 1 under the 27 to get:

$$\frac{27}{1} = \frac{x}{3}$$

Step 2. Cross multiply and divide as above  $\frac{27}{1} \times \frac{x}{3}$  to solve.

$$\begin{aligned}\text{So: } x &= 27 \times 3 \div 1 \\ x &= 81\end{aligned}$$

## **ASSIGNMENT 2 – CROSS MULTIPLY AND DIVIDE**

Solve for the missing term by using cross multiply and divide, as described on the section above. If necessary, round answers to **one decimal place**. SHOW YOUR WORK.

1.  $\frac{x}{7} = \frac{4}{35}$

2.  $\frac{2}{9} = \frac{x}{27}$

3.  $\frac{3}{18} = \frac{25}{x}$

4.  $\frac{3.2}{x} = \frac{16}{4}$

5.  $\frac{x}{6} = \frac{0.5}{17}$

6.  $\frac{25}{x} = \frac{40}{200}$

## **WORKING WITH RATIO**

Ratios can be used in word problems to express the relationship between parts.

Example: Charlie works as a cook in a restaurant. His chicken soup recipe contains:

- 11 cups of seasoned broth
- 5 cups of diced vegetables
- 3 cups of rice
- 3 cups of chopped chicken

Write the ratios for each of the following relationships.

- a) vegetables to chicken
- b) broth to vegetables
- c) chicken to rice
- d) chicken to the total ingredients in the recipe

Solution: The ratios are the numbers for the items *in the order they are asked for*.

- a) vegetables to chicken is 5:3
- b) broth to vegetables is 11:5
- c) chicken to rice is 3:3 or 1:1
- d) chicken to the total ingredients in the recipe is 3:22 (11 + 5 + 3 + 3)

## **ASSIGNMENT 3 - WORKING WITH RATIO**

1) A conveyor belt has 2 pulleys. One pulley has a diameter of 45 cm and the other has a diameter of 20 cm. What is the ratio of the smaller diameter to the larger diameter?

2) On a bicycle with more than one gear, the ratio between the number of teeth on the front gear and the number of teeth on the back gear determines how easy it is to pedal. If the front gear has 30 teeth and the back gear has 10 teeth, what is the ratio of front teeth to back teeth?

3) What is the ratio of 250 mL of grape juice concentrate to 1 L of water?  
(Hint: 1000 mL = 1L)

## **WORKING WITH PROPORTION**

When given a ratio and one of the parts, write a proportion to solve using cross multiply and divide. **Use a letter or English words in the set-up to represent the parts** to put the numbers in the correct location.

**Example 1:** For a painting, Greg mixes inks to get the tint he wants. He uses a ratio of yellow ink to white ink of 3:1. How many mL of yellow ink would he use if he used 500 mL of white ink?

**Solution:** Set up a proportion using the known ratio and English letters/words to represent the colours. The words are essential components of the proportion.

$$\frac{\text{yellow}}{\text{white}} = \frac{3}{1} = \frac{x}{500}$$

$$x = 3 \times 500 \div 1 = 1500 \text{ mL of yellow ink}$$

**Example 2:** For a painting, Greg mixes inks to get the tint he wants. He uses a ratio of red ink to yellow in of 2:3. How many mL of yellow ink would he need if he used 500 mL of red ink?

**Solution:** Set up a proportion using the known ratio and English letters/words to represent the colours.

$$\frac{\text{red}}{\text{yellow}} = \frac{2}{3} = \frac{500}{x}$$

$$x = 3 \times 500 \div 2 = 750 \text{ mL of yellow ink}$$

## **ASSIGNMENT 4 - WORKING WITH PROPORTION**

- 1) If a secretary types 55 words in one minute, how long will it take the secretary to type a 2000 word report?
- 2) The ratio between Sam's height and Jesse's height is 5:6. If Jesse is 145 cm tall, how tall is Sam? Round your answer to the nearest whole centimeter.
- 3) A mechanic can rotate the 4 tires on a truck in 15 minutes. How many minutes would it take the mechanic to rotate the tires on 5 trucks? Hint: what are you comparing??

## **MORE WORKING WITH PROPORTION**

Sometimes, the information given in a proportion question requires you to take a different approach to solving. This occurs when two parts are mixed to make something new, and the parts are then compared to the new mixture rather than each other.

Example: Susan is making lemonade. To make her lemonade, she mixes four parts of water with one part of lemon juice. If she wants to make 15 cups of lemonade, how many cups of water and how many cups of lemon juice does she need?

Solution: Since the ratio is 4:1, this means there are 5 parts in total in the lemonade. When solving this problem, one proportion is needed for each part of the ratio, comparing that part with the final mixture.

$$\text{water: } \frac{\text{water}}{\text{lemonade}} = \frac{4}{5} = \frac{x}{15}$$

$$\text{So } x = 4 \times 15 \div 5 = 12 \text{ cups of water}$$

$$\text{lemon juice: } \frac{\text{lemon juice}}{\text{lemonade}} = \frac{1}{5} = \frac{x}{15}$$

$$\text{So } x = 1 \times 15 \div 5 = 3 \text{ cups of lemon juice}$$

## **ASSIGNMENT 5 – MORE WORKING WITH PROPORTION**

1) The ratio of flour to butter in a recipe for pie crust is 2:1. If a baker makes 30 cups of piecrust, how many cups of flour and how many cups of butter does he need?

2) Two chemicals are mixed where the ratio of Chemical A to Chemical B is 3:12. If there are 45 L of the mixture, how much of each chemical is in the mixture?

## **CALCULATING UNIT PRICE**

The **unit price** of an item is *the cost of one unit*. It could be the cost of one can of pop in a 6-pack, it could be the cost of one egg in a dozen, it could be the cost of one kg in 10 kg of potatoes. Whatever the items, it is always the cost of one.

To calculate the unit price, ALWAYS **take the money and divide it by the amount** of the items you have. Remember to round your answer to 2 decimal places for money!

Example: If a carton of one dozen eggs costs \$3.29, how much does one egg cost?

Solution: Divide the money by the amount of the item.

$$\$3.29 \div 12 \text{ eggs} = \$0.27 \text{ per egg}$$

## **ASSIGNMENT 6 – CALCULATING UNIT PRICE**

1) Calculate each unit price. Round your answers to 2 decimal places (money!).

a) \$3.99 for 2 kg of bananas

\$ \_\_\_\_\_ per kg

b) 18 eggs for \$5.94

\$ \_\_\_\_\_ per egg

c) \$23.90 for 1.5 kg of pecans

\$ \_\_\_\_\_ per kg

d) \$35.16 for 40L of gas

\$ \_\_\_\_\_ per L

2) Lindsay orders a case of 1000 paper coffee cups for her restaurant. If it costs her \$94.83 for the case, how much does one cup cost?

3) Frank is a locksmith. He buys a case of 144 padlocks for \$244.97. How much does each lock cost Frank to buy?

4) If Frank sells each lock from Question 3) above for \$5.50, how much profit does he make when he sells one lock?

## **WORKING WITH UNIT PRICE**

Often unit price is used to compare costs and find which choice is the better buy (lower unit price). This is done by comparing the unit price of each item. It is not necessary to round values to only 2 decimal places (money) when comparing unit cost. In these cases, more decimals is usually better and makes it easier to compare.

Example: A 48-oz can of tomatoes costs \$2.99. An 18-oz can costs \$1.19. Which is the better buy?

Solution: Find the unit price of 1-oz for each can and compare those costs.

Can A – 48-oz can             $\$2.99 \div 48 = \$0.06229$  (approximately)

Can B – 18-oz can             $\$1.19 \div 18 = \$0.06611$  (approximately)

Therefore, the 48-oz can has a lower unit price and is the better buy.

## **ASSIGNMENT 7 – WORKING WITH UNIT PRICE**

- 1) A bookstore sells notebooks in packages of 12 for \$15.48. Another bookstore sells the same notebooks on packages of 15 for \$19.65. Which has the better unit price?
  
  
  
  
  
  
  
  
  
  
- 2) Which is the better buy: 6 muffins for \$7.59 or one dozen muffins for \$14.99?
  
  
  
  
  
  
  
  
  
  
- 3) Judd can buy three 8-foot pieces of lumber for \$2.60 each, or four 6-foot pieces for \$1.92 each. Which is the better buy? Hint: each option is 24 feet so find that total cost.



## **WORKING WITH UNIT RATE**

A **rate** is a ratio comparing two numbers measured in different units. This type of question may or may not include money, and is solved in exactly the same way as unit price while paying attention to the units.

Some examples of rates include

- \$1.69 / 100 g for the cost of ham at the deli
- 100 km/h for how fast a car travels
- \$38.00/4 h for how much you earn at work

Example: If you drive 280 km in 4 hours, how long will it take you to drive 700 km?

Solution : Use a proportion to find the time to drive the 700 km. Remember to use the English words to help with the set-up. This is essential!

$$\frac{\text{hours}}{\text{km}} \qquad \frac{4 \text{ h}}{280 \text{ km}} = \frac{x}{700}$$

$$x = 4 \times 700 \div 280 = 10 \text{ hours}$$

## **ASSIGNMENT 9 – WORKING WITH UNIT RATE**

1) A janitor makes a cleaning solution by mixing 30 g of concentrated powdered cleanser with 2 L of water. How much powder will she need for 5L of water?

2) If photocopy paper weighs 4.9 kg for every 500 sheets, how much will 700 sheets weigh?

3) If 5 cm on a map represents 2.5 km of actual ground, how many centimeters would 15 km of actual ground be on the map?

## **REVIEW – DECIMALS AND PERCENT**

A **percent** is a fraction out of 100. So if you got a mark of 86% on a test that means you got the equivalent of 86 out of 100.

A) To change a percent into a decimal, simply divide the percent number by 100.

Example: What is 67% as a decimal?

Solution:  $67\% \div 100 = 0.67$

B) To change a decimal to a percent, simply multiply the decimal by 100.

Example: Write the decimal 0.76 as a percent.

Solution:  $0.76 \times 100 = 76\%$

C) To change a fraction to a decimal, divide the numerator (top number) by the denominator (bottom number).

Example: Write the fraction  $\frac{3}{5}$  as a decimal.

Solution:  $3 \div 5 = 0.6$

This decimal can then be changed to a percent as described in part B.

## **ASSIGNMENT 10 – DECIMALS AND PERCENTS**

1) Write each percent as a decimal.

- a)  $25\% =$  \_\_\_\_\_      b)  $7\% =$  \_\_\_\_\_      c)  $15\% =$  \_\_\_\_\_  
d)  $1.5\% =$  \_\_\_\_\_      e)  $47\% =$  \_\_\_\_\_      f)  $12.5\% =$  \_\_\_\_\_

2) Write each decimal as a percent.

- a)  $0.65 =$  \_\_\_\_\_      b)  $0.04 =$  \_\_\_\_\_      c)  $0.12 =$  \_\_\_\_\_  
d)  $0.055 =$  \_\_\_\_\_      e)  $0.1 =$  \_\_\_\_\_      f)  $0.002 =$  \_\_\_\_\_

3) Write each fraction as a decimal. Round to one decimal place if needed.

- a)  $\frac{2}{5} =$  \_\_\_\_\_      b)  $\frac{5}{8} =$  \_\_\_\_\_      c)  $\frac{1}{3} =$  \_\_\_\_\_  
d)  $\frac{4}{3} =$  \_\_\_\_\_      e)  $\frac{5}{7} =$  \_\_\_\_\_      f)  $\frac{3}{9} =$  \_\_\_\_\_

## MORE DECIMALS AND PERCENT

Often we are asked to find a percent of a number. This can be done with a proportion, remembering that a percent is a number always out of 100. It can also be done by converting the percent to a decimal and multiplying. When the percentage is placed over 100, the % sign is dropped.

Example: Calculate 20% of 45

Solution A: Set up the proportion and solve. Remember to use the English words to help with the set-up. This is essential!

$$\frac{\text{part}}{\text{whole}} \quad \frac{20}{100} = \frac{x}{45}$$

$$x = 20 \times 45 \div 100 = 9 \quad \text{So, 20\% of 45 is 9.}$$

Solution B: Convert 20% to a decimal and multiply to solve.

$$20\% \div 100 = 0.20$$

$$0.20 \times 45 = 9$$

NOTE: If the percentage is greater than 100 – and it can be – your answer will be larger than the number you started with.

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It is also possible to find the percentage given two numbers. To calculate what percent one number is of another means you need to determine what number out of 100 is equal to your ratio. Using a proportion of simplifying a fraction are the two ways to solve this type of question.

Example: What percent is 5 of 20?

Solution A: Set up the proportion and solve.

$$\frac{\text{part}}{\text{whole}} \quad \frac{x}{100} = \frac{5}{20}$$

$$x = 5 \times 100 \div 20 = 25\% \quad \text{So, 5 of 20 is 25\%}$$

Solution B: Convert 5 of 20 to a fraction  $\frac{5}{20}$ , divide the numerator by the denominator, and multiply by 100 to solve.

$$5 \div 20 = 0.25$$

$$0.25 \times 100 = 25\%$$

## **ASSIGNMENT 11 – MORE DECIMALS AND PERCENTS**

1) Calculate the following percentages. SHOW YOUR WORK!

a) 15% of 300

b) 45% of 1500

c) 140% of 70

d) 175% of 24

e) 7.8% of 50

f) 0.3% of 175

g) 200% of 50

h) 135% of 25

2) Calculate what percentage the first number is of the second number. SHOW YOUR WORK!

a) 65 of 325

b) 135 of 405

c) 68 of 42

d) 13 of 65

e) 1 of 12

f) 625 of 50

## **PRICE MARKUPS**

When a person owns a business, the merchandise is bought at a wholesale cost (what the business owner pays for the goods) and is always sold at a higher price, called the retail price. The difference between these two prices is called the markup, and it can be written in dollars or as a percentage of the wholesale price.

Example: Melanie owns a clothing store. She marks up the price of her goods by 85% of the wholesale price.

a) What is the markup, in dollars, on a coat that has a wholesale price of \$125?

Solution: First, change 85% to a decimal.

$$85\% \div 100 = 0.85$$

Second, multiply the wholesale price by the markup as a decimal.

$$\$125 \times 0.85 = \$106.25 \quad \text{The markup is } \$106.25$$

b) What is the retail price? (The price Melanie charges her customers.)

Solution: Add the wholesale price and the markup together.

$$\$125 + \$106.25 = \$231.25 \quad \text{The retail cost is } \$231.25$$

## **ASSIGNMENT 12 – PRICE MARKUPS**

1) The markup on a bicycle at a sporting goods store is 125%. The wholesale price of the bicycle is \$450.00. What is the markup in dollars?

2) The wholesale price for a bottle of shampoo is \$7.25. What is the markup in dollars if the shampoo is marked up by 25%?

3) A jacket and skirt outfit is marked up by 60%. If the wholesale price of the outfit is \$117.45, what would the markup be in dollars and the retail price?

- 4) What should Max charge for a package of paper plates in his store if he bought them for \$9.00 and he wants to make a 75% profit?
- 5) The markup on a hamburger at McDonalds is 200%. A hamburger costs \$2.25 to make. What is the markup and how much will a customer be charged for the hamburger?

## **TAXES**

Taxes are added to the price of most articles and services purchased. Taxes are a percentage of the cost of the item. The higher the cost, the more taxes are paid. Tax rates are different in each province and territory across Canada. Some charge GST, PST, either, both, or HST. Tax rates will always be given to you for each question so you can solve the problems.

Example: Marie needs a pair of safety boots that cost \$179.99.

a) How much will the taxes be if GST is 5% and PST is 6%?

Solution: These taxes can be calculated separately or combined in one calculation.

Separate taxes:     5% = 0.05  
                               6% = 0.06

$\$179.99 \times 0.05 = \$9.00$	The GST is \$9.00
$\$179.99 \times 0.06 = \$10.80$	The PST is \$10.80

The total taxes paid will be  $\$9.00 + \$10.80 = \$19.80$

Combined taxes:     5% + 6% = 11%

$\$179.99 \times 0.11 = \$19.80$	The taxes are \$19.80
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b) What is the final price of the boots?

Solution: The final price is calculated by adding the tax amounts to the retail price.

$\$179.99 + \$19.80 = \$199.75$

## **ASSIGNMENT 13 – TAXES**

- 1) What would the taxes be for a jacket that is listed at \$99.95 in Nunavut, where the only tax is 5% GST?
  
  
  
  
  
  
  
  
  
  
- 2) Tara is buying a new car in Charlottetown, PEI for \$22 599. How much will the taxes be if the HST is 14%?
  
  
  
  
  
  
  
  
  
  
- 3) A return flight from Cranbrook, B.C. to Vancouver, B.C. costs \$372.00. How much will each of the taxes be if the GST is 5% and the PST is 7%? What will the total cost of the ticket, including these taxes?
  
  
  
  
  
  
  
  
  
  
- 4) Find the total cost of a washing machine that is sold for \$944.98 in Saskatchewan, where the PST is 6% and the GST is 5%.
  
  
  
  
  
  
  
  
  
  
- 5) A pair of jeans has a wholesale cost of \$30. The jeans are marked up by 125%.
  - a) What is the dollar amount of the markup?
  
  
  
  
  
  
  
  
  
  
  - b) What is the retail cost of these jeans?
  
  
  
  
  
  
  
  
  
  
  - c) The tax rates are 5% GST and 6% PST. What are the taxes on the pair of jeans?
  
  
  
  
  
  
  
  
  
  
  - d) What is the final cost, including taxes?

6) The markup on a restaurant meal is 250%. A meal costs \$7.25 to produce. How much will the customer be charged, after the markup, and then 5% GST are applied?

## **DISCOUNTS**

When you go shopping, you have seen signs that say things like “Up to 50% Off” and “Discounted Prices.” These are **promotions**, activities that increase the awareness of a product or attract customers.

When working with sales or promotions, it is possible to find the **discount** – the amount saved – as well as the final sale price.

**Example:** Samantha is buying a new TV. She sees one marked \$675.95, on sale for 20% off. How much will Samantha save (the discount) on her new TV?

**Solution:** The saving is 20% so find 20% of \$675.95.

$$20\% \div 100 = 0.20$$

$$0.20 \times \$675.95 = \$135.19$$

Samantha will save \$135.19 on the TV. The discount is \$135.19

## **ASSIGNMENT 14 – DISCOUNTS**

- 1) Jordan is buying a computer listed at \$989.98. The computer is marked 30% off. What is the discount in dollars that Jordan will receive?
  
- 2) Day-old goods at a bakery are sold at a discount of 60%. If the original price of a loaf of sweet bread was \$2.98, how much would you save by buying the day-old loaf?
  
- 3) If the sale price is 24% off, what will you save if you buy a sofa regularly priced at \$1999.97?

## **SALE PRICES**

Once the discount is found for an item, the final price paid can be found easily by subtracting the discount from the original price. This is called the **sale price**.

Example: Samantha is buying a new TV. She sees one marked \$675.95, on sale for 20% off. What is the sale price of the TV?

Solution: The saving is 20% so find 20% of \$675.95. Then subtract this amount from the original price.

$$20\% \div 100 = 0.20$$

$$0.20 \times \$675.95 = \$135.19$$

The discount is \$135.19.

$$\text{The sale price of the TV is } \$675.95 - \$135.19 = \$540.76$$

Samantha will pay \$540.76 for the TV.

## **ASSIGNMENT 15 – SALE PRICES**

1) Sarbjit charges \$24.95 for a haircut but gives students a discount of 30%. How much would a student have to pay for a haircut in this salon?

2) A can of paint costs \$59.95. There is a 20% reduction for contractors. How much money will a contractor save if she buys 5 cans of paint?

3) Chiu charges \$75.00 to paint a room, but if he paints 3 or more rooms, he gives a 15% discount on the whole job. How much will he charge if he paints 4 rooms in a house?

## **SPECIAL SALE PRICES**

Often, consumers wish to know the discount rate as a percent. To calculate this, take the discount (in dollars) and divide it by the original cost (in dollars) and multiply by 100 to make the answer a percent.

Example 1: What is the percentage markdown of a sweater that regularly sells for \$45.95, but is on sale for \$24.99?

Solution: First, calculate the discount in dollars.

$$\$45.95 - \$24.99 = \$20.96$$

The savings is the cost of one sweater - \$20.96. This is the discount.

Divide that discount by the original price, and multiply by 100.

$$\$20.96 \div \$45.95 \times 100 = 45.614$$

The percentage markdown is about 46%.

Example 2: Bamboo baskets are regularly priced at \$19.98. They are on sale, advertised as “Buy two, get one at free.” What is the markdown (or discount rate), expressed as a percent?

Solution: First, calculate the regular cost of **all** the items – 3 baskets.

$$\$19.98 \times 3 = \$59.94$$

The savings is the cost of one basket - \$19.98. This is the discount.

***Divide the savings by the regular price, and multiply by 100.***

$$\$19.98 \div 59.94 \times 100 = 33.333 \quad \text{The discount rate/percentage markdown is 33\%.$$

Notice that for both examples the part (discount or mark-up) is divided by the original amount (wholesale or retail price), times 100 to get a percentage.

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Up until this point, taxes have been ignored. But taxes usually must be added to the sale price to calculate the final cost.

***Remember that taxes are added only to the selling price, not the original price.***

The example on the next page shows how to add the taxes with these special sale price types of questions.

Example 3: Samantha is buying a new TV. She sees one marked \$675.95, on sale for 20% off. What is the final price of the TV if she is charged 12% HST?

Solution: First, find 20% of \$675.95.

$$20\% \div 100 = 0.20$$

$$0.20 \times \$675.95 = \$135.19$$

The discount is \$135.19.

Subtract this amount from the original price to get the sale price.

$$\$675.95 - \$135.19 = \$540.76$$

The sale price of the TV is \$540.76

The taxes are calculated on the sale price.

$$12\% \div 100 = 0.12$$

$$\$540.76 \times 0.12 = \$64.89$$

The final price, including taxes, is  $\$540.76 + \$64.89 = \$605.65$

## **ASSIGNMENT 16 – SPECIAL SALE PRICES**

- 1) What is the percentage markdown if a \$175 item sells for \$150?
  
  
  
  
  
  
  
  
  
  
- 2) A video game system is regularly priced at \$299.00. Its sale price is \$254.15. What is the discount rate, as a percent?
  
  
  
  
  
  
  
  
  
  
- 3) A store promotion advertises T-shirts as “Buy 4, Get 1 free.” If one T-shirt costs \$15.97, what is the discount rate, as a percent?
  
  
  
  
  
  
  
  
  
  
- 4) Cameron needs to buy 6 computers. Each computer costs \$789.00. He is told that if he buys 5 computers, he will get the 6<sup>th</sup> one free. What will be his percent saving compared to buying all 6 computers at the regular price?

5) Nicole wants to buy a coat that was originally priced at \$249.95. It is on sale at 25% off. How much will she pay in total if 5% GST and 6% PST are also charged?

6) Shelley is selling last year's frames for eye glasses in Whitehorse YT. The frames are on sale for 30% off. What will a customer pay for frames that were originally priced at \$149.00 if 5% GST is also charged?

**COMPLETE THE ASSESSMENT QUIZ 2 FROM THE WEBSITE AND EMAIL YOUR  
MARKED ASSESSMENT QUIZ TO YOUR TEACHER ALONG WITH ANY  
QUESTIONS YOU HAVE**

## **CURRENCY EXCHANGE RATES**

Different countries use different currencies and/or monetary units. For example, both Canada and the United States use a currency called the dollar, but they are different dollars. It is important to consider exchange rates when travelling to different countries. An exchange rate is simply the price of one country's currency in terms of another country's currency. The exchange rate will always be given to you, either in a chart or as a value.

Example 1: Lucas needs to convert \$500 Canadian dollars (CAD) into American dollars (USD). If one Canadian dollar is worth 0.94192 of an American dollar, how many American dollars will Lucas receive?

Solution: To calculate this value, a proportion can be set up. Use the countries to help set-up the question properly.

$$\begin{array}{r} \text{CAD} \\ \text{USD} \end{array} \quad \frac{1}{0.94192} = \frac{500}{x}$$
$$x = 500 \times 0.94192 \div 1 = \$470.96 \text{ USD}$$

Example 2: One Thai baht is worth 0.023541 of a Canadian dollar. How many bahts would a tourist in Thailand receive for \$200 CAD?

Solution: To calculate this value, a proportion can be set up.

$$\begin{array}{r} \text{Thai} \\ \text{CAD} \end{array} \quad \frac{1}{0.023541} = \frac{x}{\$200}$$
$$x = 200 \times 1 \div 0.023541 = 8495.92 \text{ bahts}$$

It is very important to use the English words as part of the proportion when setting up these problems. ***IT IS REALLY IMPORTANT!*** This will make sure that you put the numbers in the correct spots for solving the problem. **DO NOT** just think you can multiply or divide. You will make mistakes if you do that.

## **ASSIGNMENT 17 – CURRENCY EXCHANGE RATES**

1) Using the exchange rates given, calculate what each foreign currency is worth in Canadian dollars. Show the proportions as explained above!

a) 4000 Danish kroner when 1 kr = 0.221778 CAD

b) 2200 Euros when 1 € = 1.644814 CAD

c) 25 000 Chinese yuan when 1 ¥ = 0.133451 CAD

2) If one Canadian dollar (CAD) is worth 0.5911 British pounds sterling (£), calculate how many pounds sterling you would get for \$200 CAD.

3) Ray purchased some auto parts from Hungary. If the exchange rate is 1 CAD to 180.0779 Hungarian forints (Ft), how many forints will he receive for his \$500 CAD?

4) Using the exchange rates given, calculate how much foreign currency you would receive for \$200 CAD.

a) \$1 CAD = 1.72904 Brazilian reals

b) \$1 CAD = 8.71137 Moroccan dirhams

c) \$1 CAD = 3.19889 Polish zloty

5) On a particular day, the exchange rate for converting a Canadian dollar to Euros € is \$1 CAD = 0.7180 €. How many Euros would you get for \$300 CAD?

## MORE CURRENCY EXCHANGE RATES

Exchange rates change from day to day and from one currency to another. Exchanges set a **buying rate** and a **selling rate** for each currency, and these rates are different from each other. The buying rate is the rate that a bank will buy a currency from you while the selling rate is the rate at which the bank will sell a currency to you. It is important to always think about what the bank is doing in currency exchanges, not what the customer is doing!

Example 1: On a given day, the bank selling rate of the Swiss franc compared to the Canadian dollar is 1.0501, and the buying rate is 1.0213.

- How many Swiss francs would Anne receive for \$400 CAD?
- If Anne sold the Swiss francs back to the bank on the same day, how much would she receive?
- Why is there a difference, and how much is the difference?

Solutions: a) The bank is selling Swiss francs to Anne so use the selling rate of 1 Swiss franc costs 1.0501 CAD dollar.

$$\frac{\text{SFr}}{\text{CAD}} \quad \frac{1}{1.0501} = \frac{x}{\$400}$$

$$x = 400 \times 1 \div 1.0501 = 380.92 \text{ francs}$$

- b) The bank buys the Swiss francs back at a buying rate of 1 Swiss franc paying out \$1.0213 CAD dollar.

$$\frac{\text{SFr}}{\text{CAD}} \quad \frac{1}{1.0213} = \frac{380.92 \text{ SFr}}{x}$$

$$x = 380.92 \times 1.0213 \div 1 = 389.03 \text{ CAD}$$

- c) There is a difference because the selling rate is always higher than the buying rate in order for the bank to make a profit!

The difference is \$400 - \$389.03 = \$10.97  
It cost Anne \$10.97 to make these transactions.

When converting between currencies, if you are not told which number goes with which currency (ex: \$1 CAD = \$0.94192 US), then the “funky number” always goes with the Canadian currency and the other currency gets a 1.

Example 2: If the exchange rate is 0.366262 between Bahraini dinar and the Canadian dollar, how many dinar would you get for \$550 CAD?

Solution: The “funky number” **0.366262** always goes with the Canadian currency, so the proportion is set up as shown.

$$\frac{\text{BAH}}{\text{CAD}} = \frac{1}{0.366262} = \frac{x}{550}$$

This would now be solved in the usual way by cross-multiply and divide.

## **ASSIGNMENT 18 – MORE CURRENCY EXCHANGE RATES**

Remember: If the exchange rate is just given as a number (0.01956), this number is ALWAYS the number for CAD – that is, the “funky” number is always Canadian.

1) Dianne works in a bank. A customer wishes to buy 250 British pounds at a rate of 1.5379 CAD. How many Canadian dollars would the British pounds cost?

2) If the exchange rate is 0.1736 between Norwegian krone and the Canadian dollar, what would the price be in Canadian dollars of an item that cost 275 krone?

3) If a 1L bottle of pure maple syrup costs \$18.99 in Canada, what would the cost be for a tourist with Japanese yen when the exchange rate is 0.009855?

- 4) A Smartphone in Ireland costs 250 Euros (€). How much will you need to purchase the phone in Canada if the exchange rate is \$1.580814?
- 5) The price of a car in Korea is 33 500 000 won. How much does the car cost in Canadian dollars if the exchange rate is \$0.000 774?
- 6) On a particular day, the selling rate of a Euro (€) is 1.4768 and the buying rate is 1.4287. How much would a transaction cost if you exchanged \$1000 CAD for Euros and then converted them back to CAD\$ on the same day? Show all steps. (Use Example 1 on p. 26 as a model to help you.)

**EMAIL YOUR TEACHER AND REQUEST THE UNIT 1 TEST WHEN YOU ARE READY**