







## INTRODUCTION

### What is Numeracy: The Basics Workbook?

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This workbook is intended to accompany Workplace Education Manitoba's (WEM) Numeracy: The Basics Video Series, a set of 50 videos that explain essential numeracy concepts.

The refresher videos cover 25 critical numeracy topics, each broken into concept and practice.

The video series and accompanying downloadable workbooks can be found on the WEM website at [http://www.wem.mb.ca/learning\\_on\\_demand.aspx](http://www.wem.mb.ca/learning_on_demand.aspx)

These Numeracy: The Basics workbooks provide an opportunity for additional skill-building practice.

### Numeracy: The Basics topics are:

- Order of Operations 1
- Order of Operations 2
- Adding & Subtracting Fractions 1
- Adding & Subtracting Fractions 2
- Multiplying & Dividing Fractions
- Mixed & Improper Fractions
- Operations with Mixed Fractions 1
- Operations with Mixed Fractions 2
- Operations with Mixed Fractions 3
- Adding & Subtracting Decimals
- Multiplying Decimals
- Dividing Decimals
- Order of Operations & Decimals
- Decimals, Fractions & Percent 1
- Decimals, Fractions & Percent 2
- Imperial Conversions
- Metric Conversions
- Metric and Imperial Conversions
- Geometry 1 – Perimeter
- Geometry 2 – Area
- Geometry 3- Volume
- Solving Equations 1
- Solving Equations 2
- Ratio & Proportion
- Averages



## DECIMALS, FRACTIONS & PERCENTS 1

This workbook contains five skill-building practice sections. Solutions can be found at the end of the workbook.

### Practice Section A

Fill in the blank spaces in the chart below. Use the first line as a guide.

#	Decimal	Fraction /100	Percent
1	0.20	20/100	20%
2	0.35		
3		45/100	
4		91/100	
5			42%
6			97%
7	0.66		
8		43/100	
9			21%
10	0.19		
11		67/100	
12			53%
13			25.5%
14		48.5/100	
15	0.375		

**Practice Section B**

Fill in the chart below. Use the first line as a guide. Tax is added to the retail price to get the final price. The discount is subtracted from the retail price to get the final price.

#	Retail Price	Tax/Discount %	Tax/Discount \$	Final Price
1	\$20	12% tax	+2.40	\$22.40
2	\$50	25% discount		
3	\$80	20% tax		
4		50% discount	-\$10	
5		20% discount	-\$5	
6			+\$7	\$35.00
7			-\$3	\$27.00
8	\$100			\$60.00
9	\$150			\$125.00
10		10% tax		\$132.00
11		30% discount		\$90.00
12	\$75		-\$23	
13	\$110		+\$16.50	
14	\$37.50	8.5% tax		
15		20%	-\$45	

**Practice Section C**

Solve the following.

1. A sweater has a retail price of \$37.99. The sweater is discounted by 20% before a 12% tax is added to get the final price. Calculate the final price of the item.
2. Each sweater, from question 1, purchased after the first one is discounted at an additional 10% off. Determine the change a person would get if they purchased 3 sweaters and paid with a \$100 bill.
3. A pair of sandals has a retail price of \$20 and is taxed at 12%. What discount would need to be applied to a \$35 pair of sandals so that its final price (after the discount) is the same as the \$20 sandals (with 12% tax added)?
4. 15 more than 16% of a number is 65. What is the number?
5. If  $\frac{3}{8}$  of a number is 14 less than 60% of the same number, what is the number?

**Practice Section D**

In this section, solutions for the practice questions contain commonly-made errors. For each question, circle the error(s) and give a correct solution.

1. A student is calculating the original price of a pair of shoes that have been discounted 35% before a 12.5% tax was added. The final price of the shoes was \$62.80. The student does the following calculations.

$$\text{Price} - 35\% \times \text{Price} \div 0.125 = \$62.80$$

$$65\% \times \text{Price} \div 0.125 = \$62.80$$

$$65\% \times \text{Price} = \$7.85$$

$$\text{Price} = \$12.08$$

$$= \underline{\hspace{2cm}}$$

**Practice Section E**

Challenge Question. If you can do this one, then you get an A<sup>+</sup>. 😊

An escalating discount is applied to clothing at a clearance warehouse. The items that are \$70 and over are discounted by 20% per day and items under \$70 are discounted by 10% per day. Every \$7.50 decrease in price one day results in an additional 5% discount the next day. If the price of an item in the warehouse is \$110 today, what will the price be at the end of the 4<sup>th</sup> day?

$$= \underline{\hspace{2cm}}$$



# SOLUTIONS

## Set N

### Decimals, Fractions & Percents 1



**DECIMALS, FRACTIONS & PERCENTS 1****Practice Section A**

#	Decimal	Fraction /100	Percent
1	0.20	20/100	20%
2	0.35	<b>35/100</b>	<b>35%</b>
3	<b>0.45</b>	45/100	<b>45%</b>
4	<b>0.91</b>	91/100	<b>91%</b>
5	<b>0.42</b>	<b>42/100</b>	42%
6	<b>0.97</b>	<b>97/100</b>	97%
7	0.66	<b>66/100</b>	<b>66%</b>
8	<b>0.43</b>	43/100	<b>43%</b>
9	<b>0.21</b>	<b>21/100</b>	21%
10	0.19	<b>19/100</b>	<b>19%</b>
11	<b>0.67</b>	67/100	<b>67%</b>
12	<b>0.53</b>	<b>53/100</b>	53%
13	<b>0.255</b>	<b>25.5/100</b>	25.5%
14	<b>0.485</b>	48.5/100	<b>48.5%</b>
15	0.375	<b>37.5/100</b>	<b>37.5%</b>

**Practice Section B**

#	Retail Price	Tax/Discount %	Tax/Discount \$	Final Price
1	\$20	12% tax	+2.40	\$22.40
2	\$50	25% discount	<b>-\$12.50</b>	<b>\$37.50</b>
3	\$80	20% tax	<b>+\$16</b>	<b>\$96.00</b>
4	<b>\$20</b>	50% discount	-\$10	<b>\$10.00</b>
5	<b>\$25</b>	20% discount	-\$5	<b>\$20.00</b>
6	<b>\$28</b>	<b>25% tax</b>	+\$7	\$35.00
7	<b>\$30</b>	<b>10% discount</b>	-\$3	\$27.00
8	\$100	<b>40% discount</b>	<b>-\$40</b>	\$60.00
9	\$150	<b>16.7% discount</b>	<b>-\$25</b>	\$125.00
10	<b>\$120</b>	10% tax	<b>+\$12</b>	\$132.00
11	<b>\$128.57</b>	30% discount	<b>-\$38.57</b>	\$90.00
12	\$75	<b>30.7% discount</b>	-\$23	<b>\$52.00</b>
13	\$110	<b>15% tax</b>	+\$16.50	<b>\$126.50</b>
14	\$37.50	8.5% tax	<b>\$3.19</b>	<b>\$40.69</b>
15	<b>\$225</b>	20%	-\$45	<b>\$180.00</b>

**Practice Section C**

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1. Solution:

The discount is  $\$37.99 \times 0.20 = \$7.60$ , so the price that will be taxed is  $\$37.99 - 7.60 = \$30.39$ . After adding the tax ( $\$3.65$ ), the total will be  $\$30.39 \times 1.12 = \$34.04$ .

2. Solution:

The first sweater is  $\$34.04$ , the second sweater is discounted by 30%. Doing the same calculations as in question 1, the second sweater will cost:

$$\$37.99 \times 0.30 = \$11.40 \rightarrow \$37.99 - 11.40 = \$26.59 \rightarrow \$26.59 \times 1.12 = \$29.78.$$

The third sweater will cost the same as the second sweater:  $\$29.78$ .

$$\text{The change will be: } \$100 - \$34.04 + \$29.78 + \$29.78 = \$6.40.$$

3. Solution:

The  $\$20$  sandals will be  $\$20 \times 1.12 = \$22.40$  after tax.

The  $\$35$  sandals will have to be discounted  $\$15$  to make them the same price ( $\$20$ ) as the other sandals before tax. Since  $\frac{15}{35} = 0.4285714$ , there should be about a 43% discount applied.

Checking the math on that discount gives:

$$\$35 \times 0.43 = \$15.05 \rightarrow \$35.00 - 15.05 = \$19.95 \rightarrow \$19.95 \times 1.12 = \$22.34$$

The values are off by a small amount because of the rounding of  $\frac{15}{35} = 0.4285714$ .

4. Solution:

To solve this question a mathematical sentence should be constructed.

“15 more”  $\rightarrow 15 +$

“16% of a number”  $\rightarrow \frac{16}{100} \times \text{number}$

“is 65”  $\rightarrow = 65$

All together the solution is:

$$15 + \frac{16}{100} \times \text{number} = 65$$

$15 + 0.16 \times \text{number} = 65$   $\rightarrow$  subtract 15 from each side of the equation

$0.16 \times \text{number} = 50$   $\rightarrow$  divide both sides of the equation by 0.16

$$\text{number} = \frac{50}{0.16}$$

$$\text{number} = 312.5$$



5. Solution:  
Using a similar method as in question 4 yields:

$$\frac{3}{8} \times \text{number} = \frac{60}{100} \times \text{number} - 14$$

$$0.375 \times \text{number} = 0.6 \times \text{number} - 14 \rightarrow \text{move the 14 to the other side by adding 14 to each side}$$

$$14 = 0.6 \times \text{number} - 0.375 \times \text{number} \rightarrow \text{move the } 0.375 \times \text{number} \text{ to other side by subtracting from each side}$$

$$14 = 0.225 \times \text{number} \rightarrow \text{subtract like terms } (0.6 - 0.375)$$

$$\frac{14}{0.225} = \text{number} \rightarrow \text{divide both sides of the equation by } 0.225$$

$$62.\bar{2} = \text{number}$$

### Practice Section D

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1. Solution:  
The first error is in line 1. The total, including tax is calculated by multiplying by 1.125 instead of dividing by 0.125. The second error is that the price should be multiplied by 1.25, not by 0.125.

The correct solution is:

$$\text{Price} - 35\% \times \text{Price} \times 1.125 = \$62.80$$

$$(100\% - 35\%) \text{Price} \times \text{Price} \times 1.125 = \$62.80$$

$$65\% \times \text{Price} \times 1.125 = \$62.80$$

$$0.65 \times \text{Price} = \frac{\$62.80}{1.125}$$

$$0.65 \times \text{Price} = \$55.82$$

$$\text{Price} = \frac{\$55.82}{0.65}$$

$$\text{Price} = \$85.88$$



## Practice Section E

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Solution:

On the first day the price is \$110.

On the second day the \$110 is discounted 20%  $\rightarrow 110 \times 0.20 = \$22$ , so the price on day 2 will be  $110 - \$22 = \$88$ .

There was a total discount of \$22 on day 2. This qualifies for an additional 10%  $2 \times 5\%$  discount because  $\frac{\$22}{\$7.5} = 2.933333$  (which is not quite 3 groups of \$7.50). Since the day 2 price is over \$70 the base discount is still 20%. Therefore, the total discount for day 3 is 30%. The math for day 3 is  $88 \times 0.30 = \$26.40 \rightarrow 88 - \$26.40 = \$61.60$ .

The fourth day will have the original 10% discount (price is now under \$70) and a total of  $\frac{\$26.40}{\$7.50} = 3.52 \approx 3$  discounts of 5%  $\Rightarrow 15\%$ . The total discount for day 4 will be 25%.

The math for day 4 is  $61.60 \times 0.25 = \$15.40 \rightarrow 61.60 - \$15.40 = \$46.20$ . Therefore, the price at the end of the 4th day is \$46.20.