

NUMERACY:

The Basics Workbook



Set O: Decimals, Fractions & Percents 2

Companion Workbook to Numeracy: The Basics Video Series

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INTRODUCTION

What is Numeracy: The Basics Workbook?

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

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 2

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	Percent
1	0.25	$\frac{1}{4}$	25%
2	0.125		
3		$\frac{3}{8}$	
4			50%
5		$\frac{5}{16}$	
6			6.25%
7	0.75		
8		$\frac{7}{8}$	
9	0.4375		
10			62.5%
11		$\frac{13}{16}$	
12			56.25%
13	0.03125		
14			78.125%
15		$\frac{11}{32}$	

**Practice Section B**

Calculate the answer to the question in the left column, then convert the answer into a decimal, a fraction, and a percent. Use the first line as a guide.

#	Question	Decimal	Fraction	Percent
1	$\frac{1}{2} \times \frac{1}{2}$	0.25	$\frac{1}{4}$	25%
2	$\frac{1}{8} \div \frac{1}{2}$			
3	$0.025 + 0.85$			
4	$\frac{1}{2} + \frac{11}{32}$			
5	$\frac{7}{8} - \frac{1}{2}$			
6	$2.675 - 1.175$			
7	$\frac{7}{8} - \frac{5}{16}$			
8	$\frac{3}{4} \times 1.5$			
9	$\frac{1}{3} \div \frac{4}{9}$			
10	$\frac{3}{8} \times \frac{1}{2}$			
11	$2 - \frac{1}{4}$			
12	$\frac{13}{16} + \frac{1}{8}$			
13	$\frac{5}{8} \times \frac{3}{4}$			
14	$\frac{5}{32} \div \frac{1}{4}$			
15	$1\frac{3}{16} - \frac{1}{2}$			

**Practice Section C**

Answer the following questions.

1. $35\% \times 65 - \frac{5}{8} \div 2\frac{1}{2}$ expressed as a fraction is equal to _____ .
2. $1\frac{7}{16} - 2.875 + 75\% \times 66 + 0.125 \div 2$ expressed as a decimal is equal to _____ .
3. $5 - \left[3\frac{3}{4} - \left(2 - \frac{19}{8} \right) + 75\% \right]$ expressed as a percent is equal to _____ .
4. If 40% of twice a number is equal to $\frac{3}{4}$ plus 40% of six more than the number, what is the number expressed as a fraction?
5. The final price that Duane paid for a jacket after a 15% discount was \$34.68. The final price also included a 7% provincial tax and a 5% federal tax. If the discount is applied to the price of the jacket before the taxes are added, what is the original (non-sale) price of the jacket?

**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.

$$25\% \times 6 + \frac{1}{8} \times 2\frac{3}{4} \text{ expressed as a percent is equal to } \underline{\hspace{2cm}} .$$

Solution:

$$\begin{aligned} 25\% \times 6 + \frac{1}{8} \times 2\frac{3}{4} \\ &= 1.5 + \frac{1}{8} \times \frac{11}{4} \\ &= 1.5 + \frac{4+88}{32} \\ &= 1.5 + \frac{92}{32} \\ &= 1.5 + 2.90625 \\ &= 4.40625 \\ &= 440.625\% \end{aligned}$$

Practice Section E

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

The population of an ant colony increases by 25% every day. There are 20 ants in this colony on Day 1. After how many days will the population of ants exceed 30% of 555?

= _____



SOLUTIONS

Set O

Decimals, Fractions & Percents 2

**DECIMALS, FRACTIONS & PERCENTS 2****Practice Section A**

#	Decimal	Fraction	Percent
1	0.25	$\frac{1}{4}$	25%
2	0.125	$\frac{1}{8}$	12.5%
3	0.375	$\frac{3}{8}$	37.5%
4	0.50	$\frac{1}{2}$	50%
5	0.3125	$\frac{5}{16}$	31.25%
6	0.0625	$\frac{1}{16}$	6.25%
7	0.75	$\frac{3}{4}$	75%
8	0.875	$\frac{7}{8}$	87.5%
9	0.4375	$\frac{7}{16}$	43.75%
10	0.625	$\frac{5}{8}$	62.5%
11	0.8125	$\frac{13}{16}$	81.25%
12	0.5625	$\frac{9}{16}$	56.25%
13	0.03125	$\frac{1}{32}$	3.125%
14	0.78125	$\frac{25}{32}$	78.125%
15	0.34375	$\frac{11}{32}$	34.375%

**Practice Section B**

#	Question	Decimal	Fraction	Percent
1	$\frac{1}{2} \times \frac{1}{2}$	0.25	$\frac{1}{4}$	25%
2	$\frac{1}{8} \div \frac{1}{2}$	0.25	$\frac{2}{8} = \frac{1}{4}$	25%
3	$0.025 + 0.85$	0.875	$\frac{7}{8}$	87.5%
4	$\frac{1}{2} + \frac{11}{32}$	0.84375	$\frac{27}{32}$	84.375%
5	$\frac{7}{8} - \frac{1}{2}$	0.375	$\frac{3}{8}$	37.5%
6	$2.675 - 1.175$	1.5	$1\frac{1}{2} = \frac{3}{2}$	150%
7	$\frac{7}{8} - \frac{5}{16}$	0.5625	$\frac{9}{16}$	56.25%
8	$\frac{3}{4} \times 1.5$	1.125	$1\frac{1}{8} = \frac{9}{8}$	112.5%
9	$\frac{1}{3} \div \frac{4}{9}$	0.75	$\frac{9}{12} = \frac{3}{4}$	75%
10	$\frac{3}{8} \times \frac{1}{2}$	0.1875	$\frac{3}{16}$	18.75%
11	$2 - \frac{1}{4}$	1.75	$1\frac{3}{4} = \frac{7}{4}$	175%
12	$\frac{13}{16} + \frac{1}{8}$	0.9375	$\frac{15}{16}$	93.75%
13	$\frac{5}{8} \times \frac{3}{4}$	0.46875	$\frac{15}{32}$	46.875%
14	$\frac{5}{32} \div \frac{1}{4}$	0.625	$\frac{5}{8}$	62.5%
15	$1\frac{3}{16} - \frac{1}{2}$	0.6875	$\frac{11}{16}$	68.75%

**Practice Section C**

1. Solution:

$$\begin{aligned} & 35\% \times 65 - \frac{5}{8} \div 2 \frac{1}{2} \\ & = 0.35 \times 65 - \frac{5}{8} \div 2 \frac{1}{2} \\ & = 22.75 - \frac{5}{8} \div \frac{5}{2} \\ & = 22.75 - \frac{5}{8} \times \frac{2}{5} \\ & = 22.75 - \frac{10}{40} \\ & = 22.75 - 0.25 \\ & = 22.5 \\ & = 22 \frac{1}{2} = \frac{45}{2} \end{aligned}$$

2. Solution:

$$\begin{aligned} & 1 \frac{7}{16} - 2.875 + 75\% \times 66 + 0.125 \div 2 \\ & = \frac{23}{16} - 2.875 + 0.75 \times 66 + 0.125 \div 2 \\ & = 1.4375 - 2.875 + 49.5 + 0.125 \div 2 \\ & = 1.4375 - 2.875 + 49.5 - 0.0625 \\ & = 48.125 \end{aligned}$$

3. Solution:

$$\begin{aligned} & 5 - \left[3 \frac{3}{4} - \left(2 - \frac{19}{8} \right) + 75\% \right] \\ & = 5 - \left[\frac{15}{4} - \left(\frac{16}{8} - \frac{19}{8} \right) + 0.75 \right] \\ & = 5 - \left[\frac{30}{8} - \left(-\frac{3}{8} \right) + 0.75 \right] \\ & = 5 - \left[\frac{30}{8} + \frac{3}{8} + 0.75 \right] \\ & = 5 - \left[\frac{33}{8} + 0.75 \right] \\ & = 5 - 4.875 \\ & = 0.125 \\ & = 12.5\% \end{aligned}$$



4. Solution:

$$40\% \times 2 \times \text{number} = \frac{3}{4} + 40\% \times 6 + \text{number}$$

$$80\% \times \text{number} = 0.75 + 40\% \times 6 + 40\% \times \text{number}$$

$$80\% \times \text{number} = 0.75 + 0.4 \times 6 + 40\% \times \text{number}$$

$$80\% \times \text{number} = 0.75 + 2.4 + 40\% \times \text{number}$$

$$80\% \times \text{number} = 3.15 + 40\% \times \text{number}$$

$$40\% \times \text{number} = 3.15$$

$$0.4 \times \text{number} = 3.15$$

$$\text{number} = \frac{3.15}{0.4}$$

$$\text{number} = 7.875 = 7\frac{7}{8} = \frac{63}{8}$$

5. Solution:

The tax was added after the discount was applied. The price after discount, but before tax, can be found by dividing by the tax (1.12).

$$\text{The result is } \frac{\$34.68}{1.12} = \$30.96.$$

Now we have to consider the discount.

$$\text{price} - \text{price} \times 15\% = \$30.96$$

$$85\% \times \text{price} = \$30.96$$

$$\text{price} = \frac{\$30.96}{85\%}$$

$$\text{price} = \$36.42$$

The original price of the jacket was \$36.42.



Practice Section D

1. Solution:

There are two errors. The first occurs in line 3 when the two fractions are added together instead of multiplied. The second error occurs in the very last line of the solution. 4.40625 was multiplied by 100 instead of divided by 100.

The correct answer is:

$$\begin{aligned} & 25\% \times 6 + \frac{1}{8} \times 2\frac{3}{4} \\ & = 1.5 + \frac{1}{8} \times \frac{11}{4} \\ & = 1.5 + \frac{11}{32} \\ & = 1.5 + 0.34375 \\ & = 1.84375 \\ & = 0.0184375\% \end{aligned}$$

Practice Section E

Solution:

On Day 1, there are 20 ants.

On Day 2, there are 25 ants.

On Day 3, there are 31.25 (partial ants are allowed until the final answer). Continually multiplying by 1.25 (a 25% increase).

Knowing that 30% of 555 is 166.5, it is found that after 11 days the population will 186.2 ants.