WORKSHEET # 002 | Australian Curriculum Year 7 Mathematics | WM7T1U2

ACACIA TUTORING

Fractions, Decimals, and Percentages 7

Free and always will be!

Focus: A set of questions and solutions for Year 7 students focused on the topic of Fractions, Decimals and Percentages, tailored to the Australian Curriculum:

1. Converting Between Fractions, Decimals, and Percentages:

a) Convert 0.75 to a fraction and a percentage, then draw a number line between zero and one, and show the location of 0.75 with a small circle or cross.

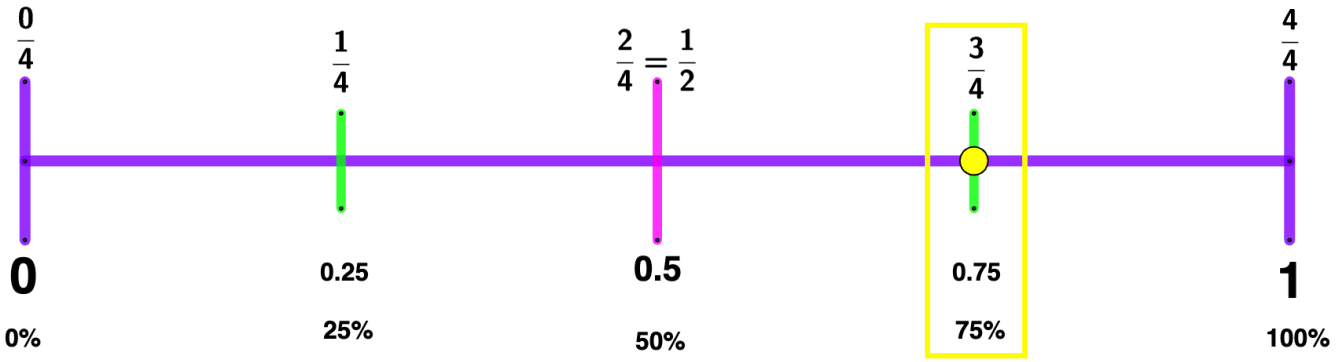
Solution:

Fraction:

$$\begin{aligned} & 0.75 \\ = & \frac{75}{100} \\ = & \frac{75 \div 25}{100 \div 25} \\ = & \frac{3}{4}. \end{aligned}$$

Percentage:

$$\begin{aligned} & 0.75 \times 100 \\ = & 75\,\%. \end{aligned}$$



b) Convert $\frac{2}{5}$ to a decimal and a percentage.

Solution:

Decimal:

$$\begin{aligned} & 2 \div 5 \\ &= \frac{2 \times 2}{5 \times 2} \\ &= \frac{4}{10} \\ &= 0.4 . \end{aligned}$$

Percentage:

$$\begin{aligned} & \frac{2}{5} \times 100 \\ &= \frac{2 \times 100}{5} \\ &= \frac{200}{5} \\ &= 40\,\% . \end{aligned}$$

Remember,

$0.1 = \frac{1}{10}$

$0.01 = \frac{1}{100}$

$0.001 = \frac{1}{1{,}000}$

$0.0001 = \frac{1}{10{,}000}$

Conversley :

$\frac{1}{10} = 0.1$

$\frac{1}{100} = 0.01$

$\frac{1}{1{,}000} = 0.001$

$\frac{1}{10{,}000} = 0.0001$

2. Comparing and Ordering:

Arrange in ascending order: $0.8,\ \frac{3}{4},\ 75\,\%,\ 0.78$**.**

Solution:

First convert all to decimals:

$0.8,\ \frac{3}{4} = (0.75),\ 75\,\% = (0.75),\ 0.78.$

Ascending order:

$\frac{3}{4}$ *or* $75\,\%,\ 0.78,\ 0.8.$

3. Operations with Fractions:

a) Add: $\frac{1}{4}+\frac{1}{2}$.

Solution:

Find a common denominator (4):

$$\frac{1}{4}+\frac{1\times 2}{2\times 2}$$
$$=\frac{1}{4}+\frac{2}{4}$$
$$=\frac{1+2}{4}$$
$$=\frac{3}{4}.$$

b) Subtract: $\frac{5}{6}-\frac{1}{3}$.

Solution:

Find a common denominator (6):

$$=\frac{5}{6}-\frac{1\times 2}{3\times 2}$$
$$=\frac{5}{6}-\frac{2}{6}$$
$$=\frac{5-2}{6}$$
$$=\frac{3\div 3}{6\div 3}$$
$$=\frac{1}{2}.$$

4. Operations with Decimals:

a) Multiply: 0.3×0.2 **.**

Solution:

$$0.3\times 0.2$$
$$=0.06.$$

OR

$$0.2\times 0.3$$
$$=\frac{2}{10}\times\frac{3}{10}$$
$$=\frac{2\times 3}{10\times 10}$$
$$=\frac{6}{100}$$
$$=0.06$$

Remember,

$0.1=\frac{1}{10}$

$0.01=\frac{1}{100}$

$0.001=\frac{1}{1{,}000}$

$0.0001=\frac{1}{10{,}000}$

Conversley :

$\frac{1}{10}=0.1$

$\frac{1}{100}=0.01$

$\frac{1}{1{,}000}=0.001$

$\frac{1}{10{,}000}=0.0001$

b) Divide: $0.8 \div 0.4$ **.**

Solution:

$$0.8 \div 0.4 = 2 .$$

OR

$$\begin{aligned} & 0.8 \div 0.4 \\ &= \frac{8}{10} \div \frac{4}{10} \\ &= \frac{8}{10} \times \frac{10}{4} \\ &= \frac{8 \times \cancel{10}}{\cancel{10} \times 4} \\ &= \frac{8}{4} \\ &= 2 . \end{aligned}$$

When dividing by a fraction, change the divide to times, and flip the fraction on the right (the one being divided by).

$$\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \times \frac{d}{c}$$

5. Percentage of a Number:

a) What is $20\,\%$ **of** 60 **?**

Solution:

$$\begin{aligned} & 20\,\% \text{ of } 60 \\ &= 0.2 \times 60 \\ &= 12 . \end{aligned}$$

OR

$$\begin{aligned} & 20\,\% \text{ of } 60 \\ &= 20\% \times 60 \\ &= \frac{\cancel{20}}{\cancel{100}} \times 60 \\ &= 0.2 \times 60 \\ &= 12 . \end{aligned}$$

OR

$$\begin{aligned} & 20\,\% \text{ of } 60 \\ &= 20\% \times 60 \\ &= \frac{20}{100} \times 60 \\ &= \frac{\cancel{20} \times \cancel{60}}{\cancel{100}} \\ &= 2 \times 6 \\ &= 12 . \end{aligned}$$

OR

$$\begin{aligned} & 20\,\% \text{ of } 60 \\ &= 20\% \times 60 \\ &= \frac{20}{100} \times 60 \\ &= \frac{20 \times 60}{100} \\ &= \frac{1200}{100} \\ &= 12 . \end{aligned}$$

OR

$$\begin{aligned} & 20\,\% \text{ of } 60 \\ &= 20\% \times 60 \\ &= \frac{20}{100} \times 60 \\ &= \frac{20 \div 20}{100 \div 20} \times 60 \\ &= \frac{1}{5} \times 60 \\ &= \frac{60}{5} \\ &= 12 . \end{aligned}$$

b) Increase 80 **by** $15\,\%$ **.**

Solution:

$$\begin{aligned} & = \text{Original Price + Markup} \\ &= 80 + (15\,\% \text{ of } 80) \\ &= 80 + (\frac{15}{100} \times 80) \\ &= 80 + (0.15 \times 80) \\ &= 80 + 12 \\ &= 92 . \end{aligned}$$

6. Word Problems:

a) A cake recipe requires $\frac{3}{4}$ of a cup of sugar. If you want to make half the recipe, how much sugar do you need?

Solution:

Half of $\frac{3}{4} = \frac{1}{2} \times \frac{3}{4}$

$= \frac{3 \times 1}{4 \times 2}$

$= \frac{3}{8}$ of a cup of sugar.

b) In a sale, all items are discounted by $25\,\%$. If a shirt originally costs $\$40$, how much will it cost after the discount?

Solution:

Discount amount:

$= 25\,\% \, of \, 40$

$= \frac{25}{100} \times 40$

$= 0.25 \times 40$

$= 10$.

New price:

$=$ Original Price $-$ Discount Amount

$= 40 - 10$

$= \$30$.

7. Decimal to Fraction Conversion:

Convert 0.625 to a fraction.

Solution:

$0.625 = \frac{625}{1000}$,

Simplify by dividing top and bottom by 125 :

$= \frac{625 \div 125}{1000 \div 125}$

$= \frac{5}{8}$.

Additional Notes for Teachers:

Learning Outcomes: Students should be adept at converting between fractions, decimals, and percentages, performing operations on these numbers, and solving real-life problems using these concepts.

Teaching Strategies: Use visual aids like fraction bars, hundred grids, or number lines to illustrate concepts. Engage students with practical applications, like shopping discounts, recipe scaling, or sports statistics. Encourage the use of estimation to check the reasonableness of answers.

Assessment: Monitor students' ability to convert, compare, and operate with fractions, decimals, and percentages in various contexts.

Resources: Use manipulatives for fractions, digital tools for quick conversion practise, or real-life contexts like budgeting games to apply percentage concepts.

This question set aligns with the Australian Curriculum for Year 7, focusing on the key proficiencies of understanding, fluency, problem-solving, and reasoning in the context of fractions, decimals, and percentages.