

$$\frac{59}{60} = 98.3\%$$

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TML Maths Assignment

DUE THURSDAY 20th SEPTEMBER

PERCENTAGES, DECIMALS, AND FRACTIONS

The following rules should be written in your maths dictionaries. They are included here to help you with this assignment, please make sure you do copy them into your dictionaries if you haven't already.

Percentage means part of one hundred, literally 'for every hundred'. It is represented by the symbol %. Percentages can be thought of and written as fractions with a denominator of one hundred, or as a decimal. Percentages can also be thought of as division by one hundred.

To write a percentage as a fraction:

- write the percentage value as the numerator of a fraction with a denominator of 100
- simplify the fraction if possible

To write a percentage as a decimal:

- divide by 100

To write a fraction as a percentage, we can use one of two methods:

1. Write the fraction as an equivalent fraction with a denominator of 100. Use the numerator of this new fraction as the percentage.
2. Multiply the fraction by 100%.

To write a decimal as a percentage multiply it by 100.

To write one amount as a percentage of another:

- write the amount we are interested in as the numerator of a fraction, with the other amount as the denominator.
- convert this fraction to a percentage. If the percentage is not a whole number, then rounding to one decimal place gives an accurate enough answer in most cases.

Fabulous work Binita,
extremely well done.
You have clearly grasped
the concepts and been able
to apply them effectively.
Impressive.

Common percentages and conversions you should memorise:

Percentage	Meaning	Fraction	Decimal
10%	10 parts out of 100	$\frac{10}{100}$	0.1
20%	20 parts out of 100	$\frac{20}{100}$	0.2
25%	25 parts out of 100	$\frac{25}{100}$	0.25
50%	50 parts out of 100	$\frac{50}{100}$	0.5
75%	75 parts out of 100	$\frac{75}{100}$	0.75
100%	100 parts out of 100	$\frac{100}{100}$ or $\frac{1}{1}$	1

Hopefully you will have the worked examples we went through in class to guide you, but if you are stuck there is a great resource on the internet here:

http://www.mathsteacher.com.au/year8/cho8_consumer/01_per/per.htm#percentage

If you scroll to the bottom there is also a list of other topics related to the percentage questions on this assignment. The worked examples are clear and should help you.

If you are still really stuck please come and see me BEFORE the assignment is due. I am happy to go through some more examples with you but I will not tell you the answers to the assignment questions.

This assignment will be marked not only on questions answered correctly, but also on the correct workings shown. You will not receive full marks if you just write down the answer. Space is provided to show workings, please do so.

Question 1 (2 marks)

At lunch time the canteen line contained 41% Year Nine students, and 17% Year Seven students. What percentage of the canteen line was Year Eight students?

$$\begin{array}{r} 41 \\ + 17 \\ \hline 58 \end{array}$$

$$\begin{array}{r} 100 \\ - 58 \\ \hline 42 \end{array}$$

$$42\% \checkmark$$

(2)

Question 2 (2 marks)

95% of all the animal species in the world are insects. Write this as a fraction in simplest form.

$$\frac{95 \div 5}{100 \div 5} = \frac{19}{20} \checkmark$$

(2)

Question 3 (18 marks)

Complete this table with the equivalent fractions, percentages and decimals.

	Fraction	Percentage	Decimal
a	$\frac{12}{25}$ ✓	48%	0.48 ✓
b	$\frac{3}{25}$ ✓	12%	0.12 ✓
c	$\frac{367}{1000}$ ✓	36.7% ✓	0.367
d	$\frac{47}{1000}$ ✓	4.7% ✓	0.047
e	$\frac{1}{50}$ ✓	2%	0.02 ✓
f	$\frac{3}{8}$	37.5% ✓	0.375 ✓
g	$\frac{1}{8}$	12.5% ✓	0.125 ✓
h	$\frac{747}{500}$ ✓	149.4% ✓	1.494
i	$\frac{12}{5}$	240% ✓	2.4 ✓

(18)

$$\frac{48}{100} \div 2 = \frac{24}{50} \div 2 = \frac{12}{25}$$

$$\frac{12}{100} \div 2 = \frac{6}{50} \div 2 = \frac{3}{25}$$

Question 4 (4 marks)

Place the following in ascending order (smallest to largest).

82%, 0.03, $\frac{7}{50}$, $\frac{3}{5}$, 0.8, 57%

0.82 0.14 0.6 0.57

(4)

$$0.03, \frac{7}{50}, 57\%, \frac{3}{5}, 82\%$$

Question 5 (8 marks)

Write the following as percentages. Round your answers to one decimal place if necessary.

a 17 out of 20 on a spelling test.

$$\frac{17}{20} \times 100 = 85\% \quad \checkmark$$

b 5 out of 22 students in the class have blonde hair.

$$\frac{5}{22} \times 100 = 22.7\% \quad \checkmark$$

c There are 100 kittens at the animal shelter, 40 of which are female.

$$\frac{40}{100} \times 100 = 40\% \quad \checkmark$$

d 54 out of 70 cars counted on the freeway had only one person in them.

$$\frac{54}{70} \times 100 = 77.1\% \quad \checkmark$$

Question 6 (8 marks)

At a local school 180 students completed an online survey. The results showed that:

22% of the students had blue eyes = x

34% spoke two or more languages = y

7% of them were left handed = z

a Calculate the number of students in each category using the above three percentages

$$\frac{x}{180} \times 100 = 22\%$$

$$x = \frac{22 \times 180}{100} = 39.6 \approx 40 \text{ students} \quad \checkmark$$

$$\frac{y}{180} \times 100 = 34\%$$

$$y = \frac{34 \times 180}{100} = 61.2 \approx 61 \text{ students} \quad \checkmark$$

$$\frac{z}{180} \times 100 = 7\%$$

$$z = \frac{7 \times 180}{100} = 12.6 \approx 13 \text{ students} \quad \checkmark$$

b Considering that we are dealing with numbers of students, what is strange about your answer to a? All of the answers were in decimals. \checkmark

c What might be the actual numbers of students represented by each of the percentages?

See above.

Question 7 (4 marks)

JB Hi Fi has two models of iPod on sale. The 8GB iPod Touch, originally \$199, has been discounted by 10%. The 16GB iPod Nano, originally \$163, has been discounted by 15%.

What is the discount amount in dollars for both items? Which represents the better saving? 16GB iPod Nano. \checkmark

Original Price	Discount Percent	Discount amount
a) \$199	10%	$199 \times \frac{10}{100} = \$19.9 \quad \checkmark$
b) \$163	15%	$163 \times \frac{15}{100} = \24.45

Question 8 (4 marks)

Oscar scores 56 out of 70 for his latest maths test. Natalie receives a mark of 37 out of a possible 45 for her ABS project. Who earned the higher mark, and by how much? Round your answer to two decimal places.

Natalie wins by 2.22% ✓

$$\text{Oscar} \rightarrow \frac{56}{70} \times 100 = 80\% \checkmark$$

$$\text{Natalie} \rightarrow \frac{37}{45} \times 100 = 82.22\% \checkmark$$

(4)

Question 9 (10 marks)

The school canteen purchases the following products at the prices listed. All items are to be marked up by 12%. Calculate the price that students will pay for these items to the nearest five cents.

a Chocolate bar \$1.50

$$1.50 \times 1.12 = \$1.68 \approx \$1.70 \checkmark$$

b Can of softdrink \$2.40

$$2.40 \times 1.12 = \$2.69 \approx \$2.70 \checkmark$$

(9)

c Pie \$2.20

$$2.20 \times 1.12 = \$2.46 \approx \$2.50$$

\$2.45

d Doughnut \$1.30

$$1.30 \times 1.12 = \$1.46 \approx \$1.50$$

\$1.45

e Packet of chips \$1.50

$$1.50 \times 1.12 = 1.68 \approx \$1.70 \checkmark$$

f Apple slice \$1.25

$$1.25 \times 1.12 \approx \$1.40 \checkmark$$