

Mathematics Level 4

Chapter 2 — Number: fractions, decimals, money and modelling

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Counting by halves, quarters and thirds; mixed numerals on a number line

Code VC2M4N04 (Victorian Curriculum F–10 Version 2.0, Mathematics, Level 4; authority file `maths_4.json`): “count by multiples of quarters, halves and thirds, including mixed numerals; locate and represent these fractions as numbers on number lines”. This section draws on elaborations VC2M4N04.E01, .E02, .E03 and .E04.

What you need to know

In Year 3 you met fractions like $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$. In this section you count with fractions, put them on number lines, and write the same amount in two different ways.

Counting by quarters. You know how to count by ones: 1, 2, 3, 4, ... You can count by quarters in the same way. Each step of the count adds one more quarter:

$\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$, $\frac{4}{4}$, $\frac{5}{4}$, $\frac{6}{4}$, ...

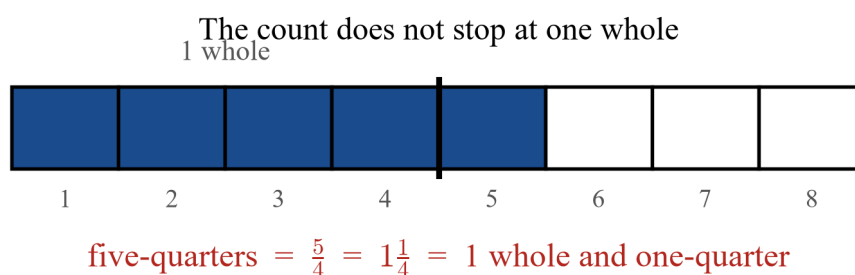
Say it in words: *one-quarter, two-quarters, three-quarters, four-quarters, five-quarters, six-quarters* ...

Reading a fraction. A fraction has two numbers, one written above the other. In $\frac{3}{4}$:

- the **bottom number, 4**, tells you the whole is cut into **4 equal parts**;
- the **top number, 3**, tells you to **count 3** of those parts.

When the count makes a whole. Counting by quarters, four quarters make one whole: $\frac{4}{4} = 1$. Counting by halves, two halves make one whole: $\frac{2}{2} = 1$. Counting by thirds, three thirds make one whole: $\frac{3}{3} = 1$.

The count does not stop at one whole. After four-quarters, the next quarter is five-quarters. Five-quarters is one whole and one more quarter, so it can also be written $1\frac{1}{4}$: say *one and one-quarter*.



Eight equal quarter-pieces in a row. Five are shaded blue. A thick line after the fourth piece shows one whole, and the label says five-quarters is one whole and one-quarter.

Counting by halves and by thirds.

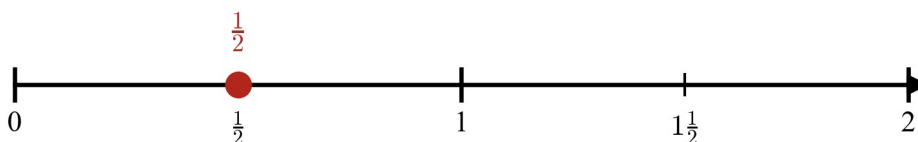
- Halves: $\frac{1}{2}$, $\frac{2}{2}$, $\frac{3}{2}$, $\frac{4}{2}$, ... Say *one-half, two-halves, three-halves* ...
- Thirds: $\frac{1}{3}$, $\frac{2}{3}$, $\frac{3}{3}$, $\frac{4}{3}$, ... Say *one-third, two-thirds, three-thirds* ...

Fractions on a number line. A fraction is a number, so it has its own position on a number line. Between 0 and 1:

- a line cut into **halves** has one mark, at $\frac{1}{2}$;
- a line cut into **quarters** has three marks, at $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$;
- a line cut into **thirds** has two marks, at $\frac{1}{3}$ and $\frac{2}{3}$.

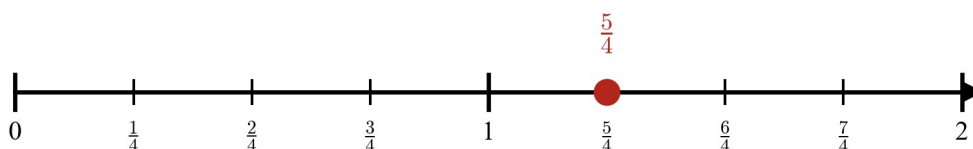
To **locate** a fraction means to find its position on the line. To **represent** a fraction on a line means to show it there, for example with a dot.

Counting by halves from 0 to 2



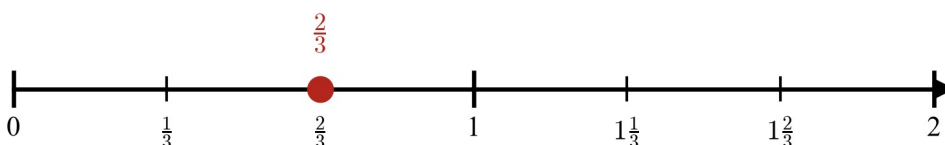
A number line from 0 to 2 with marks at every half, labelled zero, one-half, 1, one and one-half, 2. A red dot sits at one-half.

Counting by quarters from 0 to 2



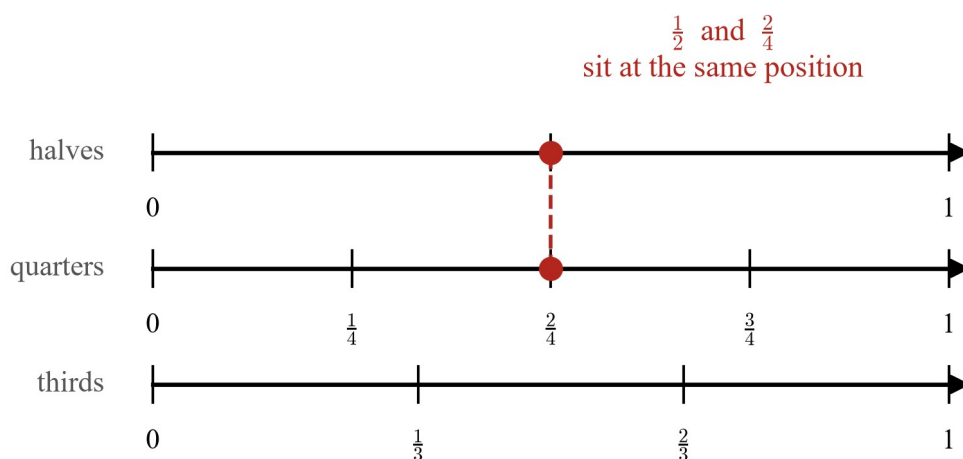
A number line from 0 to 2 with marks at every quarter, labelled in quarters. A red dot sits at five-quarters.

Counting by thirds from 0 to 2



A number line from 0 to 2 with marks at every third, labelled in thirds and mixed numerals. A red dot sits at two-thirds.

Same position, same amount. Now draw three number lines from 0 to 1, one above the other: one cut into halves, one cut into quarters and one cut into thirds. Count along each line.

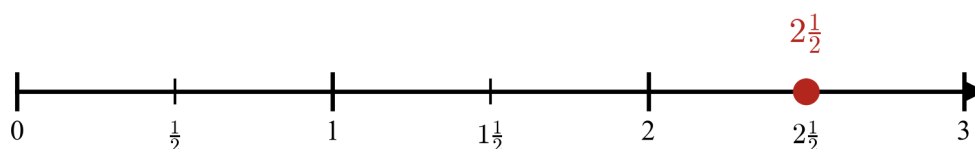


Three number lines from 0 to 1, one above the other. The top line is cut into halves, the middle line into quarters and the bottom line into thirds. Red dots at one-half on the top line and two-quarters on the middle line are joined by a dashed line, and a label says one-half and two-quarters sit at the same position.

Two-quarters of the way along the quarters line is the same position as one-half of the way along the halves line — both are half-way between 0 and 1. They are the same amount. On the thirds line, no mark sits at that position: the thirds marks are at $\frac{1}{3}$ and $\frac{2}{3}$.

Mixed numerals on a number line. A **mixed numeral** is a whole number and a fraction written together, like $1\frac{1}{2}$ or $2\frac{3}{4}$. On a number line, a mixed numeral sits between two whole numbers: $1\frac{1}{2}$ sits between 1 and 2.

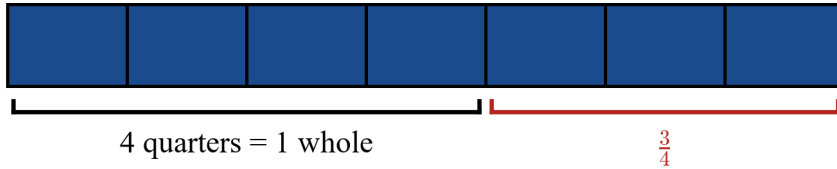
Mixed numerals on a number line from 0 to 3



A number line from 0 to 3 with marks at every half, labelled with mixed numerals: 0, one-half, 1, one and one-half, 2, two and one-half, 3. A red dot sits at two and one-half.

Improper fractions. A fraction whose top number is more than its bottom number, like $\frac{7}{4}$, is called an **improper fraction**. It is more than one whole, so it can be renamed as a mixed numeral. Group the quarters into fours. Four quarters make one whole, and the pieces left over stay as a fraction.

Seven quarters: $\frac{7}{4} = 1\frac{3}{4}$



Group the quarters into fours. One group of 4 makes 1 whole; 3 quarters are left over.

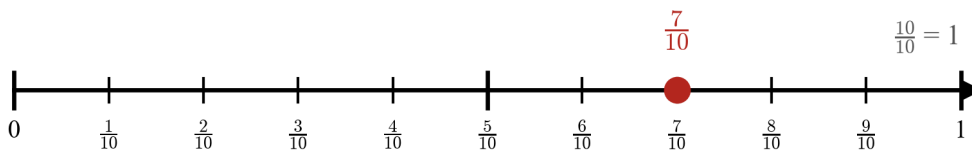
Seven quarter-pieces in a row. A line under the first four says four quarters is one whole, and a line under the last three says three-quarters. The label says seven-quarters is one and three-quarters.

Seven quarters is one group of four quarters with three quarters left over: $\frac{7}{4} = 1\frac{3}{4}$.

Renaming works the other way too. Start with the mixed numeral $1\frac{3}{4}$. One whole is four quarters. Count on three more quarters: *five-quarters, six-quarters, seven-quarters*. So $1\frac{3}{4} = \frac{7}{4}$.

Counting by tenths. You can also count by tenths. Cut each whole into 10 equal parts and count along: $\frac{1}{10}, \frac{2}{10}, \frac{3}{10}$, ... Ten tenths make one whole: $\frac{10}{10} = 1$.

Counting by tenths from 0 to 1 — ten tenths is 1 whole



A number line from 0 to 1 with marks at every tenth, labelled in tenths. A red dot sits at seven tenths, and a label at the end says ten tenths is 1.

You will work with tenths much more in section 2B.

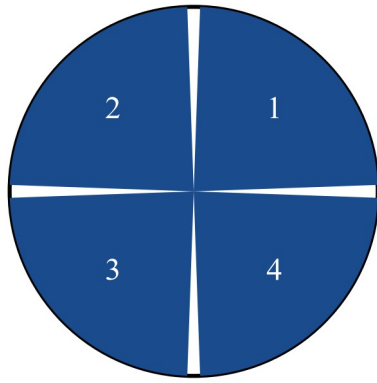
Where this section stops. Here you count by fractions, locate them on number lines, and rename between mixed numerals and improper fractions. You do not add or subtract fractions in this section — that work comes in Year 5.

Worked examples

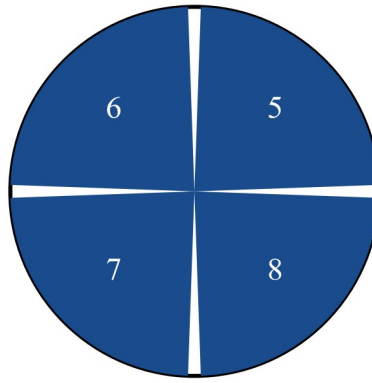
Example 1 — step by step: counting by quarters

Mia cuts 2 oranges into quarters to share at lunch. She counts all the pieces by quarters. Write the counting sequence, and give each count another name where you can.

Counting 2 oranges by quarters



orange 1



orange 2

first orange: $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}$

second orange: $\frac{5}{4}, \frac{6}{4}, \frac{7}{4}, \frac{8}{4}$

Two circles, each cut into four quarters. The pieces of the first circle are numbered 1 to 4 and the pieces of the second circle are numbered 5 to 8. Under the first circle the count reads one-quarter, two-quarters, three-quarters, four-quarters, and under the second it reads five-quarters, six-quarters, seven-quarters, eight-quarters.

Working

Comment

First orange: $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}$.

Each orange is one whole, cut into 4 quarters. $\frac{4}{4}$ is 1 whole.

Second orange: $\frac{5}{4}, \frac{6}{4}, \frac{7}{4}, \frac{8}{4}$.

The count goes on past one whole. $\frac{5}{4}$ is also $1\frac{1}{4}$. $\frac{8}{4}$ is 2 wholes.

Mia counted **8 quarters**, which is 2 wholes. The full counting sequence is:

one-quarter, two-quarters, three-quarters, four-quarters (1 whole), five-quarters ($1\frac{1}{4}$), six-quarters, seven-quarters, eight-quarters (2 wholes).

Example 2 — step by step: same position on parallel number lines

Draw three number lines from 0 to 1, one above the other: one cut into halves, one cut into quarters and one cut into thirds. Locate $\frac{1}{2}$, $\frac{2}{4}$ and $\frac{2}{3}$. Which two sit at the same position?

Working

Comment

On the halves line, $\frac{1}{2}$ is 1 jump from 0.

The halves line has one mark between 0 and 1.

On the quarters line, $\frac{2}{4}$ is 2 jumps from 0.

Each jump is one-quarter.

On the thirds line, $\frac{2}{3}$ is 2 jumps from 0.

Each jump is one-third.

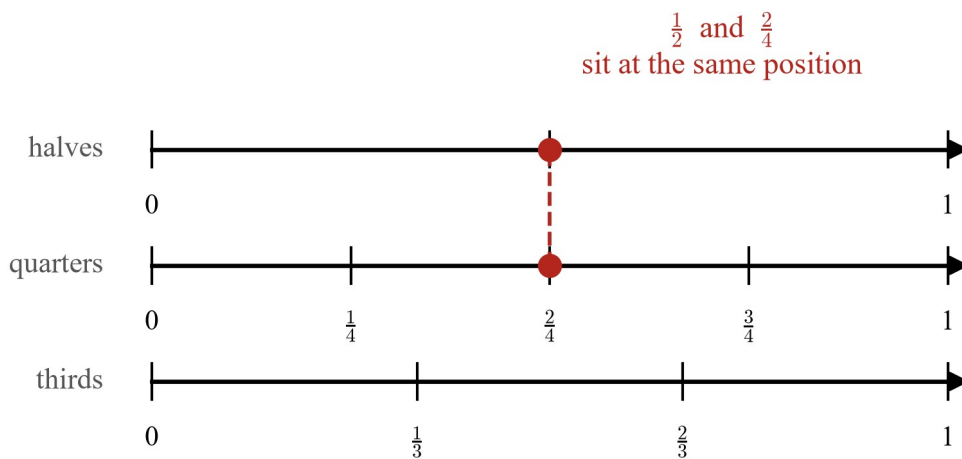
$\frac{1}{2}$ and $\frac{2}{4}$ sit at the same position.

Both are half-way between 0 and 1. They are the same amount.

$\frac{2}{3}$ sits past the half-way position.

The thirds line has no mark exactly half-way.

The figure below shows the three lines, with the same position joined by a dashed line.



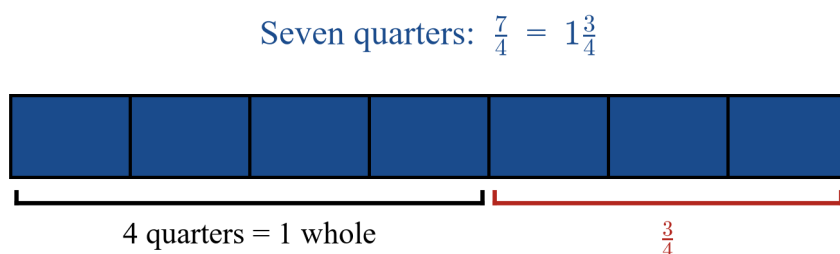
Three number lines from 0 to 1, one above the other. The top line is cut into halves, the middle line into quarters and the bottom line into thirds. Red dots at one-half on the top line and two-quarters on the middle line are joined by a dashed line, and a label says one-half and two-quarters sit at the same position.

Example 3 — step by step: renaming between improper fractions and mixed numerals

- (a) Rename $\frac{7}{4}$ as a mixed numeral. (b) Rename $2\frac{1}{3}$ as an improper fraction.

Working	Comment
(a) Four quarters make one whole. Seven quarters is one group of 4, with 3 left over.	Group the quarters into fours. The group of 4 is 1 whole. The left-over part is $\frac{3}{4}$.
So $\frac{7}{4} = 1\frac{3}{4}$.	One whole and three-quarters.
(b) One whole is $\frac{3}{3}$, so two wholes are 6 thirds. Count on one more third: seven thirds.	Count the thirds in the wholes: 3 and 3 makes 6. $2\frac{1}{3}$ is 6 thirds and one more third.
So $2\frac{1}{3} = \frac{7}{3}$.	Seven-thirds.

The figure below shows the renaming in part (a).



Group the quarters into fours. One group of 4 makes 1 whole; 3 quarters are left over.

Seven quarter-pieces in a row. A line under the first four says four quarters is one whole, and a line under the last three says three-quarters. The label says seven-quarters is one and three-quarters.

Practice questions

Questions with help

Q1. Count by quarters. Fill in the missing numbers: $\frac{1}{4}$, $\frac{2}{4}$, _____, _____, $\frac{5}{4}$.

Q2. Fill in the missing numbers.

- (a) _____ halves make 1 whole.
- (b) _____ quarters make 1 whole.
- (c) _____ thirds make 1 whole.

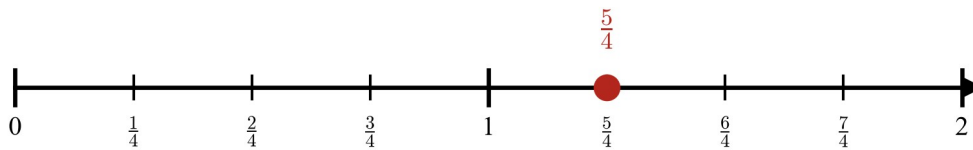
Q3. Look at $\frac{3}{4}$.

- (a) What does the bottom number, 4, tell you?
- (b) What does the top number, 3, tell you?

Q4. Count by thirds. Fill in the missing numbers: $\frac{1}{3}$, $\frac{2}{3}$, _____, $\frac{4}{3}$, _____.

Q5. Use the quarters number line below. Locate $\frac{3}{4}$. How many quarter-jumps is it from 0?

Counting by quarters from 0 to 2



A number line from 0 to 2 with marks at every quarter, labelled in quarters. A red dot sits at five-quarters.

Q6. Rename each improper fraction as a mixed numeral.

- (a) $\frac{5}{4}$
- (b) $\frac{4}{3}$

Q7. Rename each mixed numeral as an improper fraction.

- (a) $1\frac{1}{2}$
- (b) $2\frac{1}{4}$

Q8. On a number line from 0 to 1, which fraction on the halves line sits at the same position as $\frac{2}{4}$ on the quarters line?

Questions on your own

Q9. Count by halves. Start at $\frac{1}{2}$ and write the next four numbers in the count.

Q10. Draw a number line from 0 to 2. Cut it into thirds and label every mark.

Q11. Use the quarters number line from 0 to 2. Locate these numbers.

(a) $1\frac{1}{4}$

(b) $1\frac{3}{4}$

Q12. Write every quarter-count that sits between 1 and 2 on the quarters number line. Write each one as a fraction.

Q13. Rename each improper fraction as a mixed numeral.

(a) $\frac{9}{4}$

(b) $\frac{7}{3}$

(c) $\frac{10}{10}$

Q14. Rename each mixed numeral as an improper fraction.

(a) $2\frac{1}{2}$

(b) $1\frac{2}{3}$

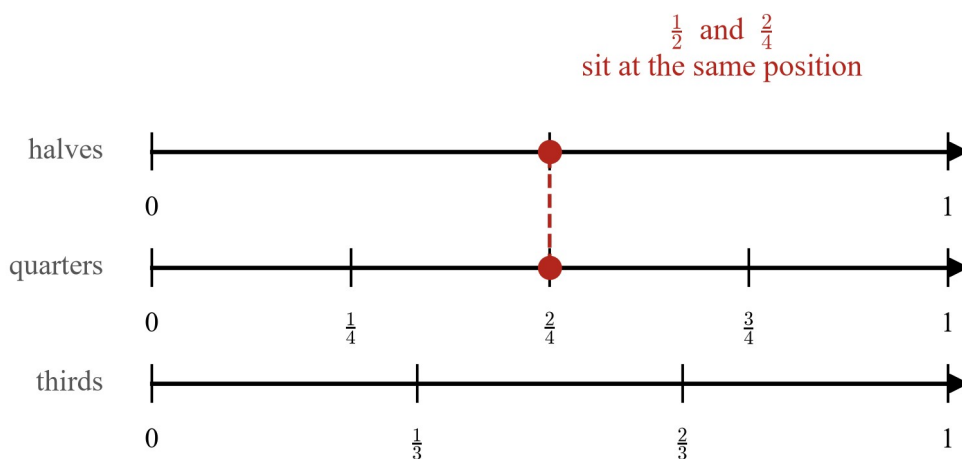
(c) $3\frac{1}{4}$

Q15. Zoe says the count by quarters must stop at $\frac{4}{4}$, because you cannot have more than one whole. Is she right? Explain your answer.

Q16. Look at the three parallel number lines from 0 to 1 below.

(a) Which fraction on the quarters line sits at the same position as $\frac{1}{2}$?

(b) Does any mark on the thirds line sit at that same position? Explain.

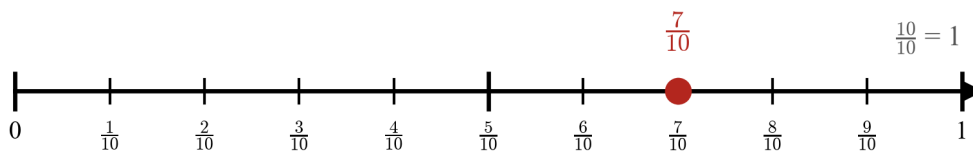


Three number lines from 0 to 1, one above the other. The top line is cut into halves, the middle line into quarters and the bottom line into thirds. Red dots at one-half on the top line and two-quarters on the middle line are joined by a dashed line, and a label says one-half and two-quarters sit at the same position.

Q17. Count by tenths.

- (a) Write the count from $\frac{1}{10}$ to $\frac{10}{10}$.
- (b) What is another name for $\frac{10}{10}$?
- (c) On the number line below, where does $\frac{7}{10}$ sit?

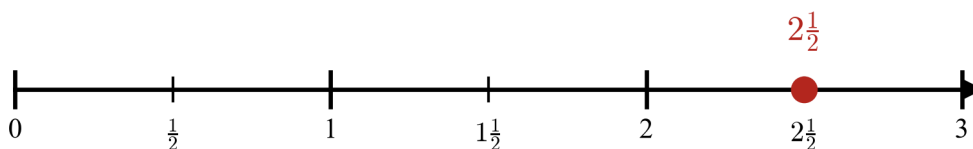
Counting by tenths from 0 to 1 — ten tenths is 1 whole



A number line from 0 to 1 with marks at every tenth, labelled in tenths. A red dot sits at seven tenths, and a label at the end says ten tenths is 1.

- Q18.** Use the number line below. Locate $2\frac{1}{2}$. Between which two whole numbers does it sit?

Mixed numerals on a number line from 0 to 3



A number line from 0 to 3 with marks at every half, labelled with mixed numerals: 0, one-half, 1, one and one-half, 2, two and one-half, 3. A red dot sits at two and one-half.

- Q19.** Explain why $\frac{5}{3}$ sits between 1 and 2 on a number line.
- Q20.** Write the count by quarters from 0 to 2 in words, the way Example 1 does. Start with *zero*, *one-quarter*, *two-quarters* and end with *two wholes*.

Applied

- Q21.** An Australian rules football match is played in four quarters.

Source: Australian Football League, *Laws of Australian Football* (13 February 2026), afl.com.au, retrieved 2026-08-20.

Think of one whole match as one whole on a number line, cut into quarters.

- (a) After the first quarter, what fraction of the match has been played?
- (b) Half-time comes at the end of the second quarter. What fraction of the match has been played? Write a second fraction that sits at the same position on the halves line.
- (c) Write the count by quarters of the match, one fraction after each quarter.
- (d) At the end of the fourth quarter the match is over. What fraction of the match has been played? Write another name for it.

Answers

Q1. $\frac{3}{4}, \frac{4}{4}$. **Q2.** (a) 2; (b) 4; (c) 3. **Q3.** (a) The whole is cut into 4 equal parts. (b) Count 3 of those parts. **Q4.** $\frac{3}{3}, \frac{5}{3}$. **Q5.** 3 quarter-jumps from 0. **Q6.** (a) $1\frac{1}{4}$; (b) $1\frac{1}{3}$. **Q7.** (a) $\frac{3}{2}$; (b) $\frac{9}{4}$. **Q8.** $\frac{1}{2}$. **Q9.** $\frac{2}{2}, \frac{3}{2}, \frac{4}{2}, \frac{5}{2}$. **Q10.** Marks at $\frac{1}{3}, \frac{2}{3}, 1, 1\frac{1}{3}, 1\frac{2}{3}$ and 2. **Q11.** (a) 5 quarter-jumps from 0, the same as $\frac{5}{4}$; (b) 7 quarter-jumps from 0, the same as $\frac{7}{4}$. **Q12.** $\frac{5}{4}, \frac{6}{4}, \frac{7}{4}$. **Q13.** (a) $2\frac{1}{4}$; (b) $2\frac{1}{3}$; (c) 1. **Q14.** (a) $\frac{5}{2}$; (b) $\frac{5}{3}$; (c) $\frac{13}{4}$. **Q15.** No. The count goes on: five-quarters, six-quarters, seven-quarters, ... **Q16.** (a) $\frac{2}{4}$; (b) no — the thirds marks are at $\frac{1}{3}$ and $\frac{2}{3}$, and not one of them is half-way. **Q17.** (a) $\frac{1}{10}, \frac{2}{10}, \frac{3}{10}, \frac{4}{10}, \frac{5}{10}, \frac{6}{10}, \frac{7}{10}, \frac{8}{10}, \frac{9}{10}, \frac{10}{10}$; (b) 1 whole; (c) 7 tenths from 0, between $\frac{1}{2}$ and 1. **Q18.** Between 2 and 3. **Q19.** $\frac{3}{3} = 1$ and $\frac{6}{3} = 2$; five thirds is more than three thirds and less than six thirds. **Q20.** Zero, one-quarter, two-quarters, three-quarters, four-quarters (1 whole), five-quarters, six-quarters, seven-quarters, eight-quarters (2 wholes). **Q21.** (a) $\frac{1}{4}$; (b) $\frac{2}{4}$, and $\frac{1}{2}$ sits at the same position; (c) $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}$; (d) $\frac{4}{4}$, which is 1 whole match.

Worked answers

Q1. Each step of the count adds one quarter: $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}, \frac{5}{4}$. The missing numbers are $\frac{3}{4}$ and $\frac{4}{4}$.

Q2. (a) 2 halves make 1 whole: $\frac{2}{2} = 1$. (b) 4 quarters make 1 whole: $\frac{4}{4} = 1$. (c) 3 thirds make 1 whole: $\frac{3}{3} = 1$.

Q3. (a) The bottom number, 4, tells you the whole is cut into **4 equal parts**. (b) The top number, 3, tells you to count 3 of those parts.

Q4. Each step adds one third: $\frac{1}{3}, \frac{2}{3}, \frac{3}{3}, \frac{4}{3}, \frac{5}{3}$. The missing numbers are $\frac{3}{3}$ and $\frac{5}{3}$.

Q5. Start at 0 and jump one quarter at a time: $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}$. So $\frac{3}{4}$ is **3 quarter-jumps** from 0 — the mark just before 1.

Q6. (a) Group into fours? No — group into the parts that make one whole. Four quarters make one whole, so $\frac{5}{4}$ is 1 whole and $\frac{1}{4}$ left over: $1\frac{1}{4}$. (b) Three thirds make one whole, so $\frac{4}{3}$ is 1 whole and $\frac{1}{3}$ left over: $1\frac{1}{3}$.

Q7. (a) One whole is $\frac{2}{2}$. Count on one more half: three-halves. So $1\frac{1}{2} = \frac{3}{2}$. (b) One whole is $\frac{4}{4}$, so two wholes are 8 quarters. Count on one more quarter: nine-quarters. So $2\frac{1}{4} = \frac{9}{4}$.

Q8. Two-quarters is half-way between 0 and 1, so it sits at the same position as $\frac{1}{2}$ on the halves line.

Q9. Each step adds one half: after $\frac{1}{2}$ come $\frac{2}{2}, \frac{3}{2}, \frac{4}{2}, \frac{5}{2}$. ($\frac{2}{2}$ is 1 whole, $\frac{4}{2}$ is 2 wholes.)

Q10. Cut each whole into three equal parts and label every mark: $\frac{1}{3}, \frac{2}{3}, 1, 1\frac{1}{3}, 1\frac{2}{3}, 2$.

Q11. (a) $1\frac{1}{4} = \frac{5}{4}$: it is **5 quarter-jumps** from 0, the first mark after 1. (b) $1\frac{3}{4} = \frac{7}{4}$: it is **7 quarter-jumps** from 0, the mark just before 2.

Q12. Between 1 and 2 the quarters line shows $\frac{5}{4}, \frac{6}{4}, \frac{7}{4}$ — that is, $1\frac{1}{4}, 1\frac{2}{4}$ and $1\frac{3}{4}$.

Q13. (a) $\frac{9}{4}$: one group of 4 quarters makes 1 whole, with 1 quarter left over — $2\frac{1}{4}$ (two groups of four make 8, with 1 left over). (b) $\frac{7}{3}$: two groups of three thirds make 2 wholes, with 1 third left over — $2\frac{1}{3}$. (c) $\frac{10}{10}$: ten tenths make exactly **1** whole.

Q14. (a) $2\frac{1}{2}$: two wholes are 4 halves; count on one more half — $\frac{5}{2}$. (b) $1\frac{2}{3}$: one whole is 3 thirds; count on two more thirds — $\frac{5}{3}$. (c) $3\frac{1}{4}$: three wholes are 12 quarters; count on one more quarter — $\frac{13}{4}$.

Q15. Zoe is **not right**. The count by quarters goes on past one whole: after four-quarters come five-quarters, six-quarters, seven-quarters, and so on. You can always count one more quarter, so the count never has to stop at $\frac{4}{4}$.

Q16. (a) $\frac{2}{4}$. (b) **No**. The thirds line has marks only at $\frac{1}{3}$ and $\frac{2}{3}$; not one of those is exactly half-way between 0 and 1, so no thirds mark sits at that position.

Q17. (a) $\frac{1}{10}, \frac{2}{10}, \frac{3}{10}, \frac{4}{10}, \frac{5}{10}, \frac{6}{10}, \frac{7}{10}, \frac{8}{10}, \frac{9}{10}, \frac{10}{10}$. (b) $\frac{10}{10} = 1$ **whole**. (c) $\frac{7}{10}$ is 7 tenths from 0 — past half-way, before 1.

Q18. $2\frac{1}{2}$ is 2 wholes and one half, so it sits **between 2 and 3** on the number line — the mark half-way between them.

Q19. Three thirds make 1 whole, so $\frac{3}{3} = 1$, and six thirds make 2 wholes, so $\frac{6}{3} = 2$. Five thirds is more than three thirds and less than six thirds, so $\frac{5}{3}$ sits **between 1 and 2**.

Q20. Zero, one-quarter, two-quarters, three-quarters, four-quarters (1 whole), five-quarters ($1\frac{1}{4}$), six-quarters, seven-quarters, eight-quarters (2 wholes).

Q21. (a) One quarter of the match is $\frac{1}{4}$ of the whole match. (b) Two quarters have been played: $\frac{2}{4}$. On the halves line, $\frac{1}{2}$ sits at the same position — half-time is half of the match. (c) After each quarter the count is: $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}$. (d) All four quarters: $\frac{4}{4}$, which is **1 whole match**.

Tenths and hundredths: place value and decimal notation

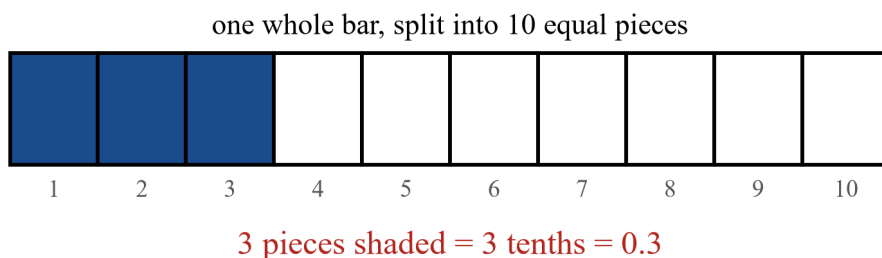
Code VC2M4N01 (Victorian Curriculum F–10 Version 2.0, Mathematics, Level 4; authority file `maths_4.json`): “recognise and extend the application of place value to tenths and hundredths and use the conventions of decimal notation to name and represent decimals”. This section draws on VC2M4N01.E01, .E02, .E03, .E04, .E05 and .E06.

What you need to know

In Year 3 you met one tenth as a fraction, $\frac{1}{10}$, and you can read and write dollars and cents. Here those ideas meet place value. This section has two parts. **Part 1** is about tenths. **Part 2** is about hundredths, and about renaming decimals so the same amount can be said more than one way.

Part 1 — Tenths

Cut one whole into 10 equal pieces. Each piece is **one tenth** of the whole.



A bar split into 10 equal pieces, with 3 pieces shaded: 3 tenths, written 0.3.

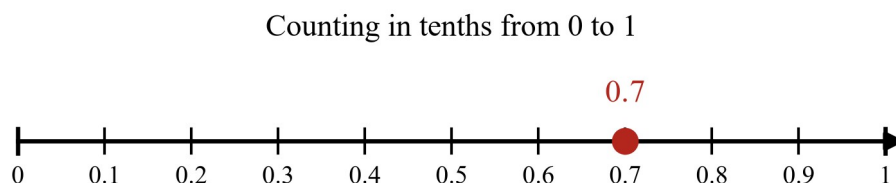
In the picture, the bar is the whole. It is split into 10 equal pieces, and 3 pieces are shaded. The shaded part is 3 tenths of the whole.

One tenth is written **0.1**. The dot is the **decimal point**. The decimal point sits between the ones place and the tenths place.

Words	Written as a decimal
one tenth	0.1
three tenths	0.3
seven tenths	0.7
nine tenths	0.9
ten tenths	1

Ten tenths make one whole. So when you count on in tenths — 0.1, 0.2, 0.3, and so on — after 0.9 comes 1.

Tenths sit on a number line. Each tick is one tenth.



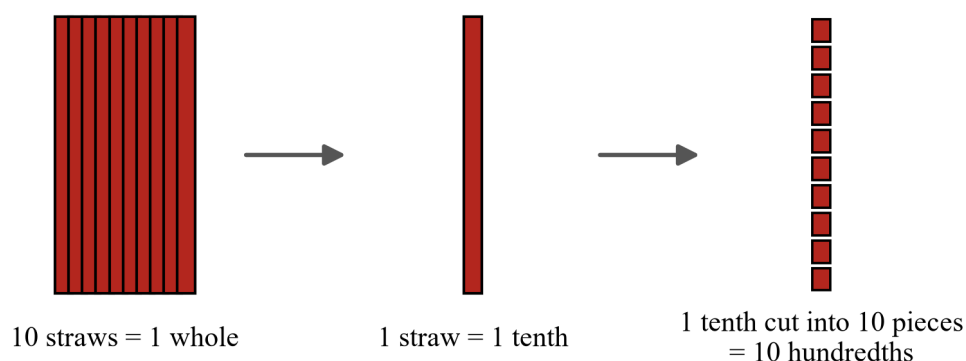
A number line from 0 to 1 with a tick at every tenth, and a dot on 0.7.

The dot sits on 0.7, which is 7 tenths of the way from 0 to 1.

Part 2 — Hundredths and renaming

Now cut each tenth into 10 equal pieces again. Those little pieces are **hundredths**.

1 whole = 10 tenths, and 1 tenth = 10 hundredths



A bundle of 10 straws stands for 1 whole; 1 straw stands for 1 tenth; that straw cut into 10 pieces gives 10 hundredths.

The picture shows the pattern: 10 straws make a whole, 1 straw is a tenth, and cutting a tenth into 10 pieces gives hundredths. So **1 tenth is the same as 10 hundredths**, and **1 whole is the same as 100 hundredths**.

One little piece of the 100 is written **0.01**. The **hundredths place** sits to the right of the tenths place.

2.75 on a place value chart

Ones		Tenths	Hundredths
2	.	7	5

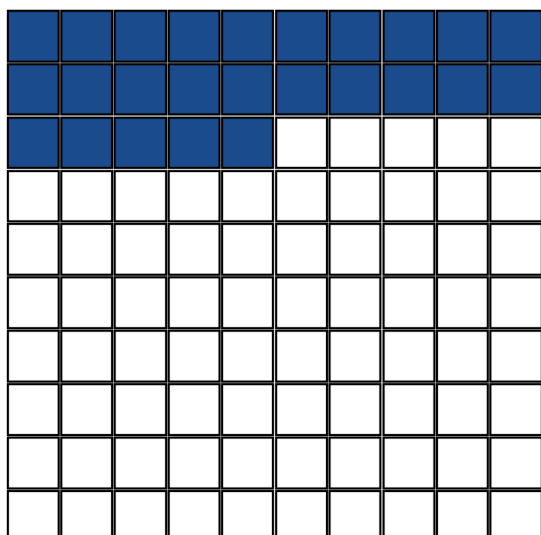
the dot is the decimal point

Place value chart with 2 in the ones column, a decimal point, 7 in the tenths column and 5 in the hundredths column.

The chart shows **2.75**: 2 ones, 7 tenths and 5 hundredths.

A whole square cut into 100 equal pieces shows hundredths well.

one whole square = 100 equal pieces



25 pieces shaded = 25 hundredths = 0.25

A square split into 100 equal pieces, with 25 pieces shaded: 25 hundredths, written 0.25.

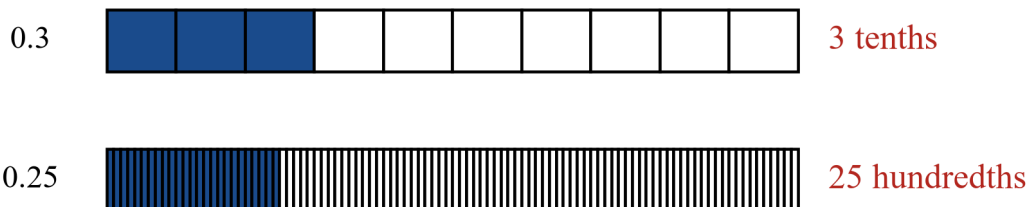
25 pieces are shaded, so the shaded part is 25 hundredths, written **0.25**.

Renaming. The same amount can be said more than one way. 0.25 is *two tenths and five hundredths*, and it is also *twenty-five hundredths*. Renaming does not change how much there is. It only changes how you say it.

Renaming also works with tenths. 3 tenths is the same as 30 hundredths, so **0.3 = 0.30**.

Which is more? Look at 0.3 and 0.25.

0.3 is more than 0.25

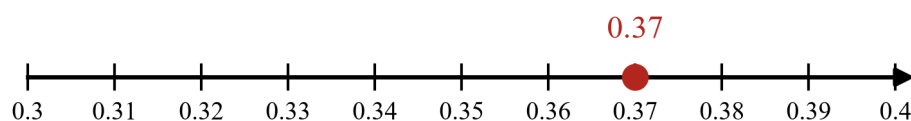


Two equal bars: one shows 0.3 as 3 tenths shaded, the other shows 0.25 as 25 hundredths shaded; 0.3 is more.

Rename first: $0.3 = 0.30$, and 30 hundredths is more than 25 hundredths. So **0.3 is more than 0.25**, even though 25 looks like a lot of hundredths. The tenths place is the one to check first.

Hundredths fill the gaps between tenths on a number line.

Between 0.3 and 0.4, counting in hundredths



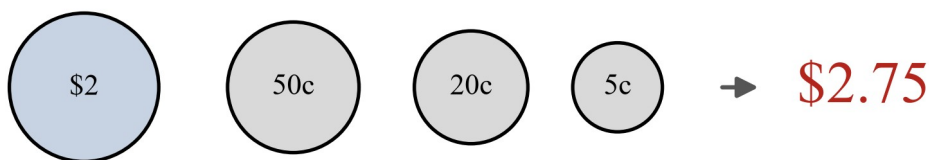
A number line from 0.3 to 0.4 with a tick at each step, and a dot on 0.37.

The dot is on 0.37: 7 hundredths of the way from 0.3 to 0.4.

Money. The Australian coins you can use today are 5c, 10c, 20c, 50c, \$1 and \$2.

Source: Royal Australian Mint, *Circulating coins*, ramint.gov.au, retrieved 2026-08-20.

One dollar is 100c, so **the cents are the hundredths of the next dollar**. A pile of coins that totals \$2.75 is 2 whole dollars and 75 hundredths of the next dollar.



\$2.75 is 2 dollars and 75 hundredths of the next dollar

the 7 means 7 tenths of a dollar, the 5 means 5 hundredths

Australian coins — one \$2 coin, one 50c coin, one 20c coin and one 5c coin — totalling \$2.75.

In \$2.75 the 7 means 7 tenths of a dollar and the 5 means 5 hundredths.

Money talk and measure talk. Money and measures carry the same digits, but they are said in different ways.

- \$2.75 is said *two dollars seventy-five*.
- 2.75 metres is said *two point seven five metres*.

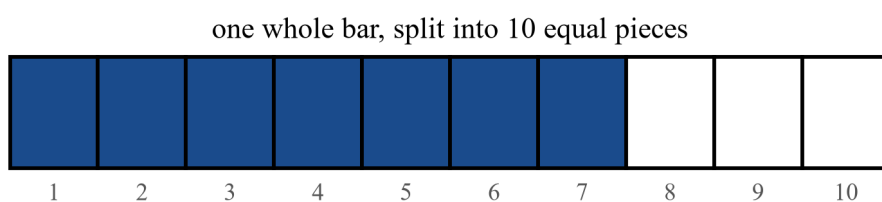
In both, the 7 means seven tenths and the 5 means five hundredths. Only the saying changes.

As far as this book goes. This section stops at hundredths. In Year 5 you will take place value one step further. Not here, not yet.

Worked examples

Example 1 — reading tenths from a bar

Here is a bar split into 10 equal pieces. 7 pieces are shaded. Write the shaded part as a decimal, and say it in words.



7 pieces shaded = 7 tenths = 0.7

A bar split into 10 equal pieces, with 7 pieces shaded: 7 tenths, written 0.7.

Working	Comment
The bar is the whole, split into 10 equal pieces.	Each piece is one tenth.
Count the shaded pieces: 1, 2, 3, 4, 5, 6, 7.	7 pieces are shaded, so the shaded part is 7 tenths.
7 tenths is written 0.7.	The 7 sits in the tenths place, after the decimal point.
The shaded part is 0.7 , said <i>seven tenths</i> .	

Example 2 — tenths in a measure: 1.5 metres

A ribbon is 1.5 metres long. Show what 1.5 metres means.



1.5 metres = 1 metre and 5 tenths of the next metre

one tenth of a metre is written 0.1 m

One full metre strip, then a second metre split into tenths with 5 tenths shaded: 1.5 metres.

Working

Comment

1.5 metres is 1 whole metre and 5 tenths of the next metre.

The 1 is in the ones place.

The 5 sits in the tenths place.

It means 5 tenths of a metre, written 0.5 m.

1 metre + 5 tenths of a metre = 1.5 m.

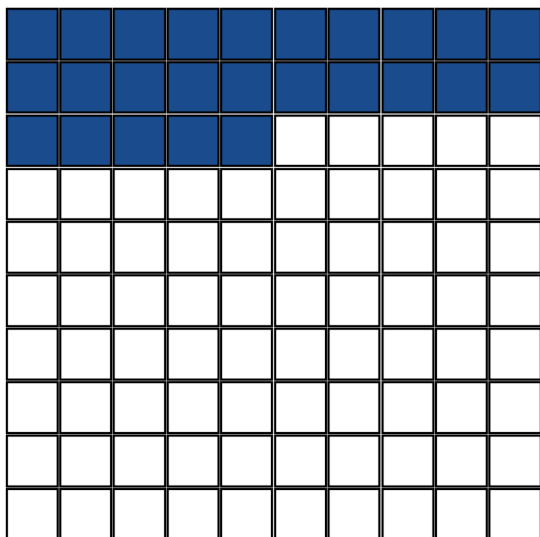
One and five tenths, written as one decimal.

So 1.5 metres is **1 metre and 5 tenths of the next metre**.

Example 3 — hundredths and renaming on a 100-square

25 pieces of the 100-square are shaded. Say the shaded part in two ways, and write it as a decimal.

one whole square = 100 equal pieces



25 pieces shaded = 25 hundredths = 0.25

A square split into 100 equal pieces, with 25 pieces shaded.

Working

Comment

Count the shaded pieces: 25.

The shaded part is 25 hundredths.

Say it one way: twenty-five hundredths.

Count all the little pieces at once.

Say it another way: two tenths and five hundredths.

2 full rows of 10 are 2 tenths; 5 more pieces are 5 hundredths.

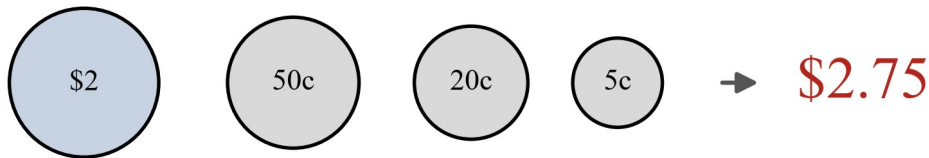
Write it: 0.25.

2 in the tenths place, 5 in the hundredths place.

So the shaded part is **0.25** — *twenty-five hundredths*, or *two tenths and five hundredths*. Both names are the same amount.

Example 4 — counting money: \$2.75, said two ways

Count the coins, write the total in dollars and cents, and say it the money way and the measure way.



\$2.75 is 2 dollars and 75 hundredths of the next dollar

the 7 means 7 tenths of a dollar, the 5 means 5 hundredths

Australian coins — one \$2 coin, one 50c coin, one 20c coin and one 5c coin.

Working	Comment
Count the dollars: one \$2 coin = \$2.	Whole dollars go to the left of the decimal point.
Count the cents: 50c + 20c + 5c = 75c.	Cents are the hundredths of the next dollar.
Write the total: \$2.75.	2 in the ones place, 7 in the tenths place, 5 in the hundredths place.
Money way: <i>two dollars seventy-five.</i>	How you say a price at a shop.
Measure way: 2.75 metres is <i>two point seven five metres.</i>	The same digits, said digit by digit.
The total is \$2.75 . In \$2.75 and in 2.75 metres, the 7 means seven tenths and the 5 means five hundredths — only the saying changes.	

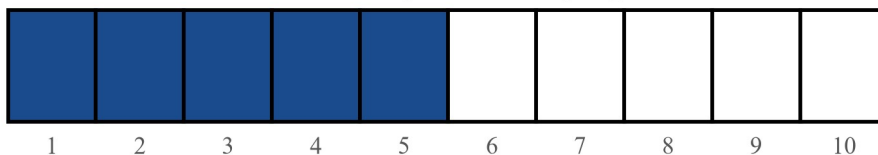
Practice questions

Part 1 — Tenths: questions with help

Q1. Cut one whole into 10 equal pieces. Each piece is one ____ of the whole.

Q2. A bar is split into 10 equal pieces. 5 pieces are shaded. Write the shaded part as a decimal.

one whole bar, split into 10 equal pieces



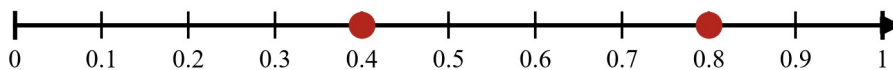
A bar split into 10 equal pieces, with 5 pieces shaded.

Q3. Count on in tenths: 0.2, 0.3, ____, ____, 0.6.

Q4. Write each one as a decimal.

- (a) six tenths
- (b) nine tenths

Q5. Two dots sit on the number line. Write the decimal under each dot.



A number line from 0 to 1 with a tick at every tenth, and dots on 0.4 and 0.8.

Q6. A rope is 1.7 metres long. Fill in: 1.7 metres is ____ whole metre(s) and ____ tenths of the next metre.

Part 1 — Tenths: questions on your own

Q7. How many tenths make one whole?

Q8. Write each one as a decimal.

- (a) four tenths
- (b) eight tenths
- (c) ten tenths

Q9. Which is more, 0.6 or 0.4? Say how you know.

Q10. Fill in the missing numbers.

- (a) Count on in tenths: 0.7, 0.8, ____, ____.
- (b) Count back in tenths: 0.5, 0.4, ____, ____.

Q11. Fill in the boxes.

- (a) 0.5 is ____ tenths.
- (b) 1 whole is ____ tenths.

Q12. A jump measures 1.3 metres. How many whole metres and how many tenths of the next metre is that?

Q13. Which decimal says *six tenths*: 0.06, 0.6 or 6.0?

Q14. Ben says 0.9 means nine ones. Is Ben right? Explain.

Q15. Start at 0.3 and count on in tenths. Write the next three numbers.

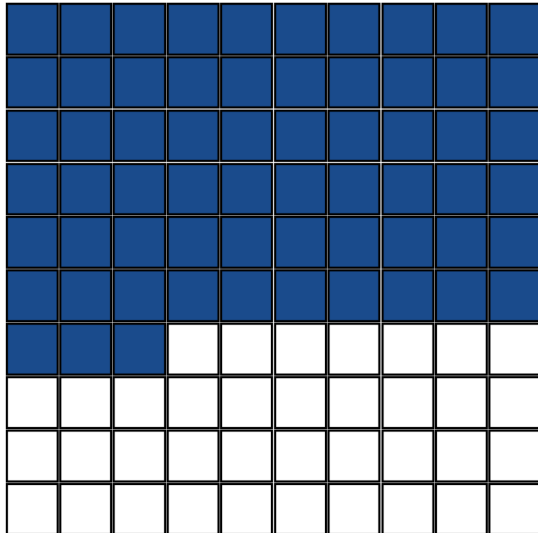
Part 2 — Hundredths and renaming: questions with help

Q16. Fill in.

- (a) 1 tenth is the same as ____ hundredths.
- (b) 1 whole is the same as ____ hundredths.

Q17. A whole square is cut into 100 equal pieces. 63 pieces are shaded. Write the shaded part as a decimal.

one whole square = 100 equal pieces



A square split into 100 equal pieces, with 63 pieces shaded.

Q18. In the decimal 0.46, which place is the 4 in? Which place is the 6 in?

Q19. Write each one as a decimal.

- (a) three tenths and eight hundredths
- (b) forty-one hundredths

Q20. Rename.

- (a) 6 tenths = ____ hundredths.
- (b) $0.2 = 0.\underline{\hspace{1cm}}$ (write it in hundredths).

Q21. One dollar is ____ cents. So the cents of a dollar are its ____.

Part 2 — Hundredths and renaming: questions on your own

Q22. Say 0.25 in words, two different ways.

Q23. Rename.

- (a) 8 tenths, in hundredths.
- (b) 70 hundredths, in tenths.

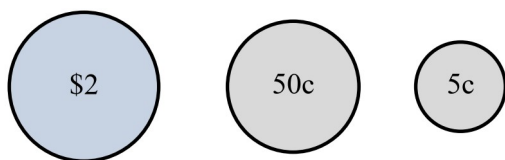
Q24. Which is more, 0.35 or 0.53? Explain how you know, using place value.

Q25. 2.75 metres is 2 whole metres and how many hundredths of the next metre?

Q26. Put these in order, from the least to the most: 0.72, 0.2, 0.27.

Q27. Write the decimal that is 3 ones, 0 tenths and 8 hundredths.

Q28. Count the coins and write the total in dollars and cents.



Australian coins — one \$2 coin, one 50c coin and one 5c coin.

Q29. Write how each one is said.

- (a) \$4.25
- (b) 4.25 metres

Q30. Mia says 0.25 is more than 0.4, because 25 is more than 4. Is Mia right? Explain.

Applied

Q31. At a school sports day in Geelong, three friends measure their standing long jumps in metres.

- Ava jumps 1.42 metres.
 - Noah jumps 1.4 metres.
 - Zara jumps 1.38 metres.
- (a) Write each jump as whole metres and hundredths of the next metre.
 - (b) Put the jumps in order, from the longest to the shortest.
 - (c) Who jumped the longest?
 - (d) Noah says his jump, 1.4 metres, is the same length as 1.40 metres. Is he right? Explain.
-

Answers

Q1. tenth. **Q2.** 0.5. **Q3.** 0.4, 0.5. **Q4.** (a) 0.6 (b) 0.9. **Q5.** 0.4 and 0.8. **Q6.** 1 whole metre and 7 tenths. **Q7.** 10. **Q8.** (a) 0.4 (b) 0.8 (c) 1. **Q9.** 0.6; 6 tenths is more than 4 tenths. **Q10.** (a) 0.9, 1.0 (b) 0.3, 0.2. **Q11.** (a) 5 (b) 10. **Q12.** 1 whole metre and 3 tenths. **Q13.** 0.6. **Q14.** No; the 9 is in the tenths place, so it means nine tenths, not nine ones. **Q15.** 0.4, 0.5, 0.6. **Q16.** (a) 10 (b) 100. **Q17.** 0.63. **Q18.** The 4 is in the tenths place; the 6 is in the hundredths place. **Q19.** (a) 0.38 (b) 0.41. **Q20.** (a) 60 (b) 0.20. **Q21.** 100 cents; hundredths. **Q22.** Twenty-five hundredths; or two tenths and five hundredths. **Q23.** (a) 80 hundredths, 0.80 (b) 7 tenths, 0.7. **Q24.** 0.53; 5 tenths is more than 3 tenths. **Q25.** 75. **Q26.** 0.2, 0.27, 0.72. **Q27.** 3.08. **Q28.** \$2.55. **Q29.** (a) *four dollars twenty-five* (b) *four point two five metres*. **Q30.** No; $0.4 = 0.40$, and 40 hundredths is more than 25 hundredths. **Q31.** (a) Ava 1 m and 42 hundredths; Noah 1 m and 40 hundredths; Zara 1 m and 38 hundredths. (b) 1.42, 1.40, 1.38. (c) Ava. (d) Yes; 4 tenths = 40 hundredths, so $1.4 = 1.40$.

Worked answers

Q1. One whole cut into 10 equal pieces gives tenths. Each piece is one **tenth**.

Q2. The bar is the whole, in 10 equal pieces. 5 are shaded, so the shaded part is 5 tenths, written **0.5**.

Q3. Count on in tenths: 0.2, 0.3, **0.4**, **0.5**, 0.6. Each step adds one tenth.

Q4. (a) Six tenths is **0.6**. (b) Nine tenths is **0.9**. The digit sits in the tenths place, after the decimal point.

Q5. The first dot is 4 ticks on: **0.4**. The second dot is 8 ticks on: **0.8**.

Q6. The 1 in 1.7 is the ones place and the 7 is the tenths place. So 1.7 metres is **1** whole metre and **7** tenths of the next metre.

Q7. Ten tenths make one whole: 0.1, 0.2, ..., 0.9, then 1. So **10** tenths.

Q8. (a) **0.4** (b) **0.8** (c) ten tenths is one whole, written **1**.

Q9. **0.6** is more. Both numbers are in tenths, and 6 tenths is more than 4 tenths — on the number line, 0.6 sits further along than 0.4.

Q10. (a) 0.7, 0.8, **0.9**, **1.0**. (b) 0.5, 0.4, **0.3**, **0.2**.

Q11. (a) 0.5 is **5** tenths. (b) 1 whole is **10** tenths.

Q12. 1.3 metres is **1** whole metre and **3** tenths of the next metre.

Q13. **0.6**. The 6 must sit in the tenths place. In 0.06 the 6 is in the hundredths place (six hundredths), and 6.0 is 6 ones.

Q14. Ben is **not right**. In 0.9 the 9 sits after the decimal point, in the tenths place, so 0.9 means nine tenths. Nine ones would be written 9, with the 9 in the ones place.

Q15. 0.3, then **0.4**, **0.5**, **0.6**. Each step adds one tenth.

Q16. (a) Cut a tenth into 10 pieces and you get **10** hundredths. (b) 10 tenths of 10 hundredths each gives **100** hundredths in a whole.

Q17. 63 of the 100 pieces are shaded: 63 hundredths, written **0.63**.

Q18. In 0.46, the first digit after the decimal point is the tenths place, so the 4 is in the **tenths** place. The next digit is the **hundredths** place, so the 6 is in the hundredths place.

Q19. (a) 3 in the tenths place and 8 in the hundredths place: **0.38**. (b) Forty-one hundredths: put 4 in the tenths place and 1 in the hundredths place, giving **0.41**.

Q20. (a) 6 tenths = **60** hundredths ($0.6 = 0.60$). (b) $0.2 = \mathbf{0.20}$: 2 tenths is the same as 20 hundredths.

Q21. One dollar is **100** cents. So the cents are the **hundredths** of the next dollar.

Q22. 0.25 is *twenty-five hundredths*, or *two tenths and five hundredths*. Both name the same amount.

Q23. (a) 8 tenths = 80 hundredths, so $0.8 = \mathbf{0.80}$. (b) 70 hundredths = **7 tenths**, so $0.70 = 0.7$.

Q24. **0.53** is more. Check the tenths place first: 0.53 has 5 tenths and 0.35 has 3 tenths, and 5 tenths is more than 3 tenths.

Q25. The 7 is 7 tenths and the 5 is 5 hundredths, so 2.75 metres is 2 whole metres and **75** hundredths of the next metre.

Q26. Rename 0.2 as 0.20. Then compare 0.20, 0.27 and 0.72 in hundredths: 20, 27, 72. The order is **0.2, 0.27, 0.72**.

Q27. 3 in the ones place, 0 in the tenths place, 8 in the hundredths place: **3.08**. The 0 is needed to hold the tenths place.

Q28. Dollars: the \$2 coin gives \$2. Cents: $50\text{c} + 5\text{c} = 55\text{c}$. The total is **\$2.55**.

Q29. (a) \$4.25 is said *four dollars twenty-five*. (b) 4.25 metres is said *four point two five metres*.

Q30. Mia is **not right**. Rename 0.4 as 0.40: that is 40 hundredths, and 40 hundredths is more than 25 hundredths. So 0.4 is more than 0.25. You must look at the place each digit is in, not at the digits as if they were a whole number.

Q31. (a) Ava: 1.42 m is **1 metre and 42 hundredths**. Noah: 1.4 m is 1 metre and 4 tenths, and 4 tenths = 40 hundredths, so **1 metre and 40 hundredths**. Zara: 1.38 m is **1 metre and 38 hundredths**. (b) In hundredths: 42, 40, 38. From the longest to the shortest: **1.42, 1.40, 1.38**. (c) **Ava** jumped the longest. (d) **Yes**. 1.4 is 1 metre and 4 tenths; 4 tenths is the same as 40 hundredths, so $1.4 = 1.40$. Renaming does not change the length.

Equivalent fractions and the connection to decimals

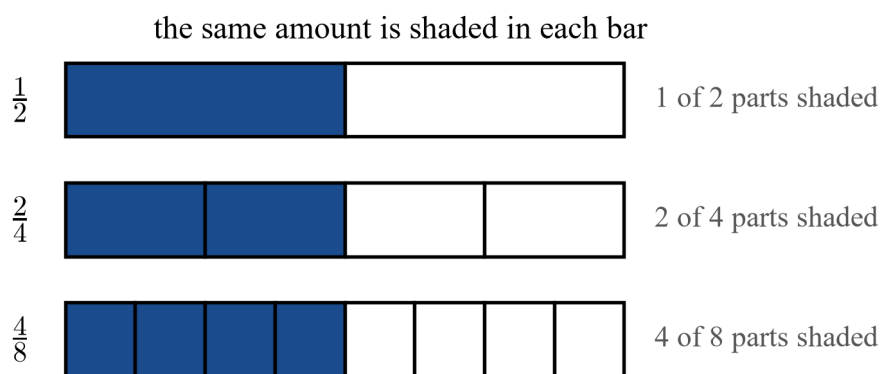
Code VC2M4N03 (Victorian Curriculum F–10 Version 2.0, Mathematics, Level 4; authority file `maths_4.json`): “find equivalent representations of fractions using related denominators and make connections between fractions and decimal notation”. This section draws on VC2M4N03.E01, .E02, .E03, .E04 and .E05.

What you need to know

In Year 3 you met halves, thirds, quarters, fifths and tenths. This section has two parts. **Part 1** is about equivalent fractions — different names for the same amount. **Part 2** joins fractions to decimals, so the same amount can be written both ways.

Part 1 — Equivalent fractions

Here are three bars of the same size, with the same amount shaded in each.



$$\frac{1}{2} = \frac{2}{4} = \frac{4}{8} \quad \text{— three names for the same amount}$$

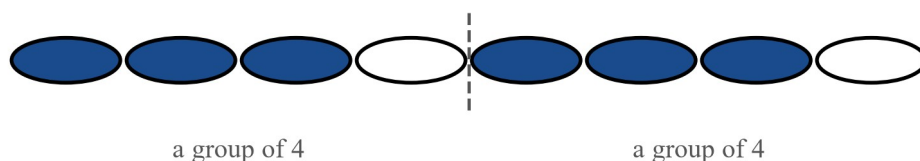
Three equal bars: 1 of 2 parts shaded, 2 of 4 parts shaded, 4 of 8 parts shaded; the same amount is shaded, so one half, two quarters and four eighths are equal.

The shaded amount is the same in every bar. So $\frac{1}{2}$, $\frac{2}{4}$ and $\frac{4}{8}$ are three names for the same amount. Fractions that name the same amount are called **equivalent fractions**.

How do the names connect? Cut every part in half and the number of parts doubles. Halves become quarters, quarters become eighths. The top number doubles and the bottom number doubles, and the amount stays the same. The bottom numbers of the fractions are called the **denominators**. When one of them is double the other — like 4 and 8, or 5 and 10 — the denominators are **related**, and the fractions are easy to match.

Equivalent fractions also live inside collections. If 3 in every 4 dots are blue, then in a collection of 8 dots, 6 are blue.

3 dots in every group of 4 are blue



3 in every 4: $\frac{3}{4}$ of the 8 dots is 6 dots

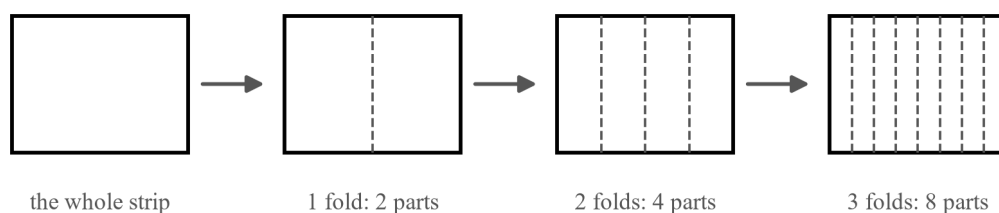
$$\frac{3}{4} = \frac{6}{8}$$

Eight dots in two groups of 4; 3 dots in every group of 4 are blue, so three quarters of the 8 dots is 6 dots, the same as six eighths.

Three in every four, and six in every eight, shade the same amount. So $\frac{3}{4} = \frac{6}{8}$.

Folding paper shows the same idea. Fold a strip in half, then in half again, then in half again. The fold lines match, so the fractions match.

each fold doubles the number of equal parts



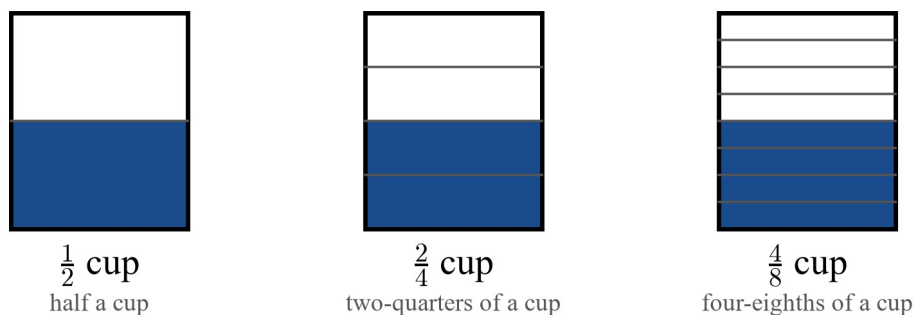
$$\frac{4}{8} = \frac{2}{4} = \frac{1}{2} \quad \text{— the fold lines match}$$

A paper strip folded in half, then half again, then half again: 1 fold gives 2 parts, 2 folds give 4 parts, 3 folds give 8 parts, and the fold lines match, so four eighths, two quarters and one half are equal.

Four eighths, two quarters and one half are the same amount: $\frac{4}{8} = \frac{2}{4} = \frac{1}{2}$.

Capacity measures work the same way. Half a cup of flour is also two-quarters of a cup, and also four-eighths of a cup. The marks on the cup just sit closer together.

half a cup of flour, shown three ways



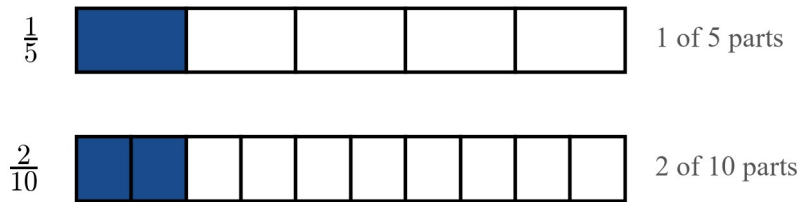
$$\frac{1}{2} = \frac{2}{4} = \frac{4}{8} \text{ of the cup}$$

Three straight-sided cups holding the same amount of flour: half a cup, two-quarters of a cup, four-eighths of a cup, so half, two quarters and four eighths of the cup are equal.

Part 2 — The fraction–decimal connection

Fold a strip into fifths, then cut each fifth in half to make tenths. One fifth lines up with two tenths.

the same length, shaded two ways



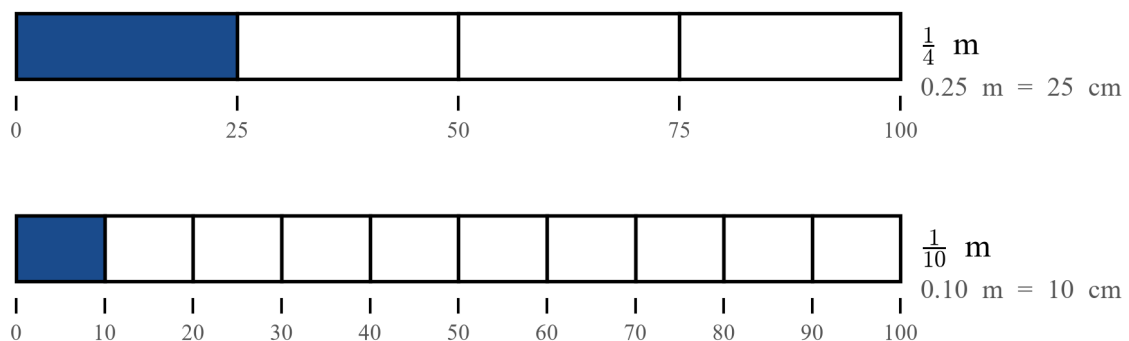
$$\frac{1}{5} = \frac{2}{10} = 0.2$$

Two equal bars: 1 of 5 parts shaded and 2 of 10 parts shaded; the same length is shaded, so one fifth equals two tenths, which is 0.2.

Two tenths is a decimal amount: 0.2. So one fifth, two tenths and 0.2 are three names for the same amount: $\frac{1}{5} = \frac{2}{10} = 0.2$.

A metre joins fractions to decimals too. Cut a metre into 4 equal parts and each part is a quarter of a metre. Cut it into 10 equal parts and each part is a tenth of a metre. The numbers under the strips count centimetres — 100 cm in the whole metre.

fractions of a metre, written as decimals



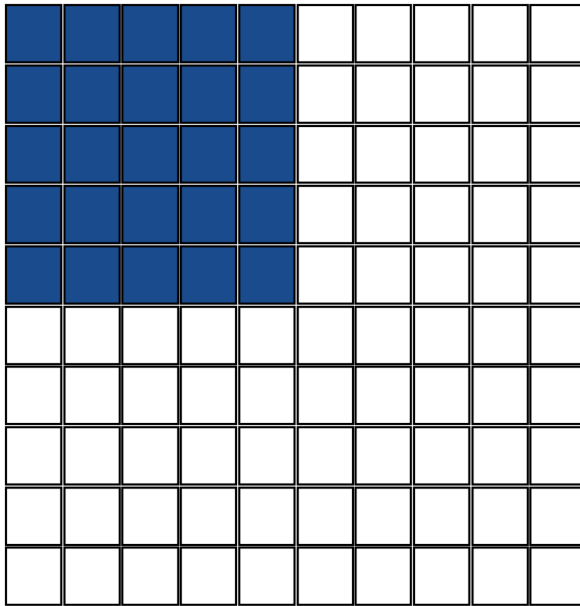
the numbers under the strips are centimetres

Two metre strips: one cut into quarters with 25 cm shaded, one cut into tenths with 10 cm shaded; a quarter of a metre is 0.25 metres, and a tenth of a metre is 0.10 metres.

A quarter of a metre is $100 \text{ cm} \div 4 = 25 \text{ cm}$. Twenty-five hundredths of a metre is written 0.25, so $\frac{1}{4}$ of a metre is 0.25 metres. A tenth of a metre is 10 cm, written 0.10 metres.

The hundred square says it again. One quarter of the square is 25 of the 100 small squares.

one quarter of the square is shaded



25 of the 100 small squares are blue

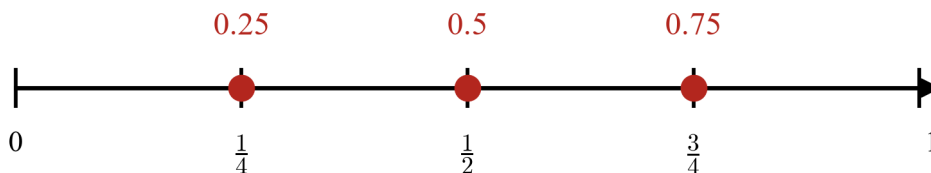
$$\frac{1}{4} = \frac{25}{100} = 0.25$$

A hundred square with one quarter shaded: 25 of the 100 small squares are blue, so one quarter equals twenty-five hundredths, which is 0.25.

So $\frac{1}{4} = \frac{25}{100} = 0.25$. Quarters, hundredths and decimals all name the same amounts.

On a number line, one point can carry two names at once — a fraction and a decimal.

each point has two names: a decimal and a fraction



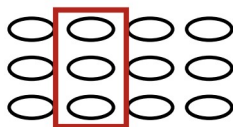
A number line from 0 to 1 with ticks at quarters; the points at one quarter, one half and three quarters are also labelled 0.25, 0.5 and 0.75.

The point on $\frac{1}{4}$ is the point on 0.25. The point on $\frac{1}{2}$ is the point on 0.5. The point on $\frac{3}{4}$ is the point on 0.75.

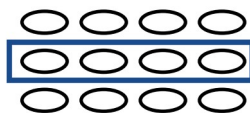
Money says it too. One dollar is 100c, so a quarter of a dollar is 25c, written \$0.25, and half a dollar is 50c, written \$0.5.

Arrays join fractions to multiplication and division. Twelve dots sit in 3 rows of 4.

$$12 \text{ dots} = 3 \text{ rows of } 4: \quad 3 \times 4 = 12$$



split 12 into 4 equal columns
 $12 \div 4 = 3$, so $\frac{1}{4}$ of 12 is 3



split 12 into 3 equal rows
 $12 \div 3 = 4$, so $\frac{1}{3}$ of 12 is 4

Twelve dots in 3 rows of 4: boxing one of the 4 equal columns shows $12 \div 4 = 3$, so one quarter of 12 is 3; boxing one of the 3 equal rows shows $12 \div 3 = 4$, so one third of 12 is 4.

Split the 12 dots into 4 equal parts: $12 \div 4 = 3$, so $\frac{1}{4}$ of 12 is 3. Split them into 3 equal parts: $12 \div 3 = 4$, so $\frac{1}{3}$ of 12 is 4. And $3 \times 4 = 12$ ties it together. A fraction of a collection is division in disguise.

As far as this book goes. This section matches fractions with decimals for halves, quarters, fifths, tenths and hundredths. Adding and subtracting fractions, and decimals beyond hundredths, are Year 5 work. Not here, not yet.

Worked examples

Example 1 — cutting parts in half (Part 1)

A bar shows $\frac{3}{4}$ shaded. Cut each quarter in half. What fraction is shaded now?

each part cut in half: 4 parts become 8 parts



$$\frac{3}{4} = \frac{6}{8}$$

Two equal bars: 3 of 4 parts shaded, and 6 of 8 parts shaded; each part cut in half turns 4 parts into 8, so three quarters equals six eighths.

Working	Comment
The bar shows 3 of 4 parts shaded.	The shaded amount is $\frac{3}{4}$.
Cut each quarter in half: 4 parts become 8 parts.	The bottom number doubles: 4 and 8 are related denominators.
Each shaded quarter becomes 2 shaded eighths: $3 \times 2 = 6$.	The top number doubles too.
So $\frac{3}{4} = \frac{6}{8}$.	Same amount, two names.

Example 2 — a cup of flour (Part 1)

A cake recipe asks for half a cup of flour. The cup has marks for quarters, and marks for eighths. Show half a cup on each set of marks.

half a cup of flour, shown three ways



$\frac{1}{2}$ cup
half a cup



$\frac{2}{4}$ cup
two-quarters of a cup



$\frac{4}{8}$ cup
four-eighths of a cup

$$\frac{1}{2} = \frac{2}{4} = \frac{4}{8} \text{ of the cup}$$

Three cups holding the same amount of flour: half a cup, two quarters of a cup and four eighths of a cup — the same amount with different names.

Working

Comment

Half a cup fills 2 of the 4 quarter marks.

$$\frac{1}{2} = \frac{2}{4}.$$

Cut each quarter in half: half a cup fills 4 of the 8 marks.

$$\frac{2}{4} = \frac{4}{8}.$$

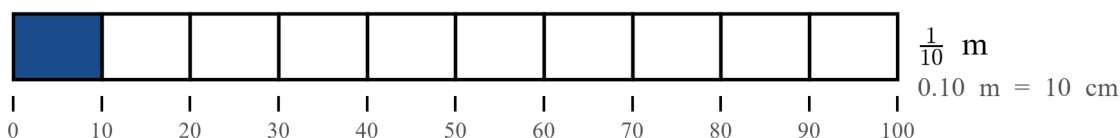
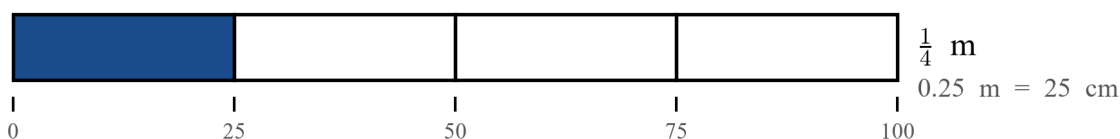
So $\frac{1}{2} = \frac{2}{4} = \frac{4}{8}$ of the cup.

The flour amount never changes.

Example 3 — a quarter of a metre (Part 2)

Find $\frac{1}{4}$ of a metre. Write it as a decimal, and in centimetres.

fractions of a metre, written as decimals



the numbers under the strips are centimetres

A metre strip cut into quarters with one quarter shaded; the marks show 25 cm, so a quarter of a metre is 0.25 metres, which is 25 cm.

Working

Comment

One whole metre is 100 cm.

The metre is the whole.

$100 \div 4 = 25$, so $\frac{1}{4}$ of a metre is 25 cm.

Four equal parts of 100 cm.

25 cm is 25 hundredths of a metre: $\frac{25}{100}$.

Hundredths of the whole metre.

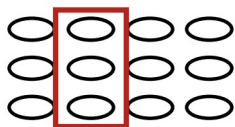
$\frac{25}{100}$ is written 0.25.

So $\frac{1}{4} \text{ m} = 0.25 \text{ m} = 25 \text{ cm}$.

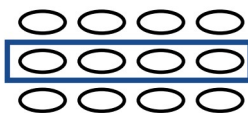
Example 4 — the array (Part 2)

Use the array of 12 dots to show that $\frac{1}{4}$ of 12 is 3, and write the matching number facts.

$$12 \text{ dots} = 3 \text{ rows of } 4: \quad 3 \times 4 = 12$$



split 12 into 4 equal columns
 $12 \div 4 = 3$, so $\frac{1}{4}$ of 12 is 3



split 12 into 3 equal rows
 $12 \div 3 = 4$, so $\frac{1}{3}$ of 12 is 4

Twelve dots in 3 rows of 4; one boxed column shows one quarter of 12 is 3, one boxed row shows one third of 12 is 4, and $3 \times 4 = 12$.

Working	Comment
3 rows of 4 make 12: $3 \times 4 = 12$.	The multiplication fact.
Split 12 into 4 equal parts: $12 \div 4 = 3$.	The division fact.
So $\frac{1}{4}$ of 12 is 3.	One of the 4 equal parts.
Split 12 into 3 equal parts: $12 \div 3 = 4$, so $\frac{1}{3}$ of 12 is 4.	One of the 3 equal parts.

Practice questions

Part 1 — Equivalent fractions: questions with help

Q1. Look at the equal bars picture. How many quarters line up with $\frac{1}{2}$? How many eighths line up with $\frac{1}{2}$? Write the fraction family.

Q2. A bar shows $\frac{3}{5}$ shaded. Cut each fifth in half. How many tenths are shaded now? Fill in: $\frac{3}{5} = \square/10$.

each fifth cut in half: 5 parts become 10 parts

$$\frac{3}{5}$$



3 of 5 parts shaded

$$\frac{6}{10}$$



6 of 10 parts shaded

$$\frac{3}{5} = \frac{6}{10}$$

Two equal bars: 3 of 5 parts shaded, and 6 of 10 parts shaded; each fifth cut in half turns 5 parts into 10, so three fifths equals six tenths.

Q3. Fold a paper strip into quarters and shade $\frac{2}{4}$. Fold it in half again, into eighths. Each quarter becomes 2 eighths. Fill in: $\frac{2}{4} = \square/8$.

Q4. Three in every 4 dots are blue. In a collection of 8 dots, how many dots are blue? Fill in: $\frac{3}{4} = \square/8$.

Q5. Look at the cups picture. Half a cup of flour is $\frac{2}{4}$ of a cup. Fill in: $\frac{2}{4} = \square/8$ of a cup.

Q6. Fill in the missing number.

(a) $\frac{1}{2} = \frac{2}{4} = \square/8$

(b) $\frac{2}{4} = \square\%$

(c) $\frac{1}{2} = \square\%$

Part 1 — Equivalent fractions: questions on your own

Q7. Is $\frac{4}{8}$ the same amount as $\frac{2}{4}$? Say how you know.

Q8. Two-fifths means 2 in every 5. Show it in tenths: $\frac{2}{5} = \square\%$.

Q9. Cut each quarter in half. Fill in: $\frac{3}{4} = \square\%$.

Q10. A paper strip is folded into eighths, and $\frac{4}{8}$ of it is shaded. Write two other fractions for the shaded amount.

Q11. Circle the fractions that are other names for $\frac{1}{2}$: $\frac{2}{4}$, $\frac{3}{8}$, $\frac{5}{10}$, $\frac{4}{10}$.

Q12. A recipe needs half a cup of milk. Write half a cup as quarters, and as eighths.

Q13. Three in every 5 dots are blue. In a collection of 10 dots, how many are blue? Write the matching fraction: $\frac{3}{5} = \square\%$.

Q14. True or false? $\frac{3}{4} = \frac{6}{8}$. Explain with a picture or with words.

Q15. Start with $\frac{1}{4}$. Cut each quarter in half, then in half again. Write the fraction family: $\frac{1}{4} = \square\%$ = $\square\%$.

Part 2 — The fraction–decimal connection: questions with help

Q16. Look at the fifths and tenths picture. Fill in: $\frac{1}{5} = \frac{2}{10} = 0.\square$.

Q17. Look at the metre picture. $\frac{1}{4}$ of a metre is $\square$ hundredths of a metre, which is $\square$ cm, written 0. $\square$ metres.

Q18. Write $\frac{1}{5}$ as a decimal. Write $\frac{2}{10}$ as a decimal. What do you notice?

Q19. Look at the hundred square picture. Write the shaded amount as hundredths, and as a decimal.

Q20. Look at the metre picture. $\frac{1}{10}$ of a metre is 0.10 metres. How many centimetres is that?

Q21. Three quarters of the hundred square would shade 75 small squares. Fill in: $\frac{3}{4} = \frac{75}{100} = 0.\square$.

Part 2 — The fraction–decimal connection: questions on your own

Q22. Write each fraction as a decimal.

(a) $\frac{1}{4}$

(b) $\frac{1}{2}$

(c) $\frac{3}{4}$

Q23. Write each fifth as tenths, then as a decimal.

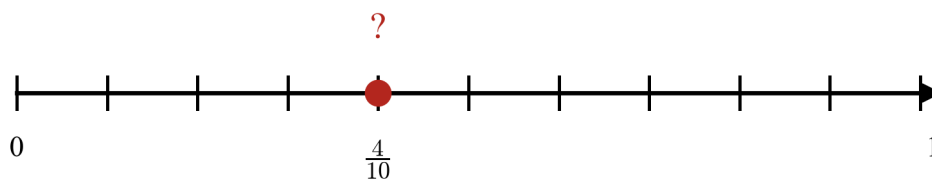
(a) $\frac{1}{5}$

(b) $\frac{2}{5}$

(c) $\frac{3}{5}$

Q24. A dot sits on a number line. Write the ? in the picture as fifths, and as a decimal.

the ? is two more names for the same point



A number line from 0 to 1 with a tick at every tenth and a dot on four tenths; a ? above the dot asks for two more names for the same point.

Q25. A ribbon is $\frac{3}{4}$ of a metre long. Write its length in centimetres, and as a decimal.

Q26. 0.75 metres is how many quarters of a metre? Write it as a fraction.

Q27. Look at the array picture. Fill in.

(a) $\frac{1}{4}$ of 12 is $\square$, because $12 \div 4 = \square$.

(b) $\frac{1}{3}$ of 12 is $\square$, because $12 \div 3 = \square$.

Q28. Five rows of 4 make 20: $5 \times 4 = 20$. Use it to fill in.

(a) $\frac{1}{4}$ of 20 is $\square$.

(b) $\frac{1}{5}$ of 20 is $\square$.

Q29. Circle the fractions that are other names for 0.5: $\frac{1}{2}$, $\frac{2}{4}$, $\frac{3}{5}$, $\frac{5}{10}$, $\frac{4}{8}$.

Q30. True or false? $\frac{1}{10}$ of a metre is 1 cm. Explain.

Applied

Q31. At a market stall in Ballarat, Priya cuts ribbon from a 1-metre length for her bookmarks.

(a) She cuts the metre into 4 equal parts and uses 1 part. What fraction of the metre is that? Write it as a decimal, and in centimetres.

(b) For the next bookmark she cuts a metre into 8 equal parts and uses 2 parts. What fraction of the metre is that? Is it the same length as part (a)? How do you know?

(c) A longer bookmark uses $\frac{3}{4}$ of a metre. Priya cuts each quarter in half. How many eighths is $\frac{3}{4}$? Write the equivalent fraction.

(d) A friend asks for 0.5 metres of ribbon. Write 0.5 as a fraction of the metre.

Answers

Q1. 2 quarters; 4 eighths. $\frac{1}{2} = \frac{2}{4} = \frac{4}{8}$. **Q2.** 6 tenths. $\frac{3}{5} = \frac{6}{10}$. **Q3.** $\frac{4}{8}$. **Q4.** 6 dots. $\frac{3}{4} = \frac{6}{8}$. **Q5.** $\frac{4}{8}$. **Q6.** (a) 4 (b) 4 (c) 5. **Q7.** Yes; cutting each quarter in half gives 4 eighths, the same amount. **Q8.** $\frac{4}{10}$. **Q9.** $\frac{6}{8}$. **Q10.** $\frac{2}{4}$ and $\frac{1}{2}$. **Q11.** $\frac{2}{4}$ and $\frac{5}{10}$. **Q12.** $\frac{2}{4}$ and $\frac{4}{8}$. **Q13.** 6 dots. $\frac{3}{5} = \frac{6}{10}$. **Q14.** True; cutting each quarter in half gives 6 eighths, the same amount. **Q15.** $\frac{1}{4} = \frac{2}{8} = \frac{4}{16}$. **Q16.** 0.2. **Q17.** 25 hundredths; 25 cm; 0.25 metres. **Q18.** 0.2 and 0.2; they are the same, because $\frac{1}{5} = \frac{2}{10}$. **Q19.** $\frac{25}{100}$; 0.25. **Q20.** 10 cm. **Q21.** 0.75. **Q22.** (a) 0.25 (b) 0.5 (c) 0.75. **Q23.** (a) $\frac{2}{10} = 0.2$ (b) $\frac{4}{10} = 0.4$ (c) $\frac{6}{10} = 0.6$. **Q24.** $\frac{2}{5}$ and 0.4. **Q25.** 50 cm; 0.5 metres. **Q26.** 3 quarters; $\frac{3}{4}$. **Q27.** (a) 3, because $12 \div 4 = 3$. (b) 4, because $12 \div 3 = 4$. **Q28.** (a) 5 (b) 4. **Q29.** $\frac{1}{2}$, $\frac{2}{4}$, $\frac{5}{10}$ and $\frac{4}{8}$. **Q30.** False; $\frac{1}{10}$ of a metre is 10 cm, because $100 \div 10 = 10$. **Q31.** (a) $\frac{1}{4}$; 0.25 metres; 25 cm. (b) $\frac{2}{8}$; yes — $\frac{2}{8} = \frac{1}{4}$, the same length. (c) $\frac{6}{8}$. (d) $\frac{1}{2}$ (or $\frac{2}{4}$, $\frac{4}{8}$, $\frac{5}{10}$).

Worked answers

- Q1.** In the picture, 2 quarters and 4 eighths cover the same length as $\frac{1}{2}$. So $\frac{1}{2} = \frac{2}{4} = \frac{4}{8}$.
- Q2.** Cutting each fifth in half turns 5 parts into 10, and the 3 shaded parts become 6 shaded tenths. So $\frac{3}{5} = \frac{6}{10}$.
- Q3.** Each shaded quarter becomes 2 shaded eighths, so $2 \times 2 = 4$ eighths. $\frac{2}{4} = \frac{4}{8}$.
- Q4.** Three in every 4, twice, is 6 in every 8. So 6 dots are blue and $\frac{3}{4} = \frac{6}{8}$: the missing bottom number is **8**.
- Q5.** Cutting each quarter of the cup in half gives eighths; 2 quarters become 4 eighths. $\frac{2}{4} = \frac{4}{8}$ of a cup.
- Q6.** (a) $\frac{1}{2} = \frac{2}{4} = \frac{4}{8}$. (b) $\frac{2}{4} = \frac{4}{8}$. (c) Cut each half into 5: $\frac{1}{2} = \frac{5}{10}$.
- Q7. Yes.** Cut each quarter in half and $\frac{2}{4}$ becomes $\frac{4}{8}$ — the same amount shaded, so the fractions are equivalent.
- Q8.** Two in every 5, doubled, is 4 in every 10. So $\frac{2}{5} = \frac{4}{10}$.
- Q9.** Three shaded quarters, each cut in half, give 6 shaded eighths. $\frac{3}{4} = \frac{6}{8}$.
- Q10.** Four eighths fold back to 2 quarters, and 2 quarters fold back to 1 half: $\frac{2}{4}$ **and** $\frac{1}{2}$.
- Q11.** $\frac{1}{2} = \frac{2}{4}$ (cut the half in two) and $\frac{1}{2} = \frac{5}{10}$ (cut the half in five). $\frac{3}{8}$ and $\frac{4}{10}$ are not the same amount as $\frac{1}{2}$.
- Q12.** Half a cup is 2 quarters, and it is 4 eighths of the cup: $\frac{2}{4}$ **and** $\frac{4}{8}$.
- Q13.** Three in every 5, twice, is 6 in every 10: **6 dots**, and $\frac{3}{5} = \frac{6}{10}$.
- Q14. True.** Cut each of the 3 shaded quarters in half: $3 \times 2 = 6$ shaded eighths. The amount is unchanged, so $\frac{3}{4} = \frac{6}{8}$.
- Q15.** Cutting each quarter in half gives eighths: $\frac{1}{4} = \frac{2}{8}$. Cutting each of the eighths in half gives sixteenths: $\frac{2}{8} = \frac{4}{16}$. The family is $\frac{1}{4} = \frac{2}{8} = \frac{4}{16}$.
- Q16.** $\frac{1}{5} = \frac{2}{10}$, and 2 tenths is written **0.2**.
- Q17.** $\frac{1}{4}$ of a metre is 25 of the 100 hundredths, which is 25 cm, written **0.25** metres.
- Q18.** $\frac{1}{5} = \frac{2}{10} = \mathbf{0.2}$, and $\frac{2}{10} = \mathbf{0.2}$. They are the same decimal, because $\frac{1}{5}$ and $\frac{2}{10}$ are equivalent fractions.
- Q19.** 25 of the 100 squares are shaded: $\frac{25}{100}$, written **0.25**.
- Q20.** 0.10 metres is 10 hundredths of the metre, and the metre is 100 cm, so it is **10 cm**.
- Q21.** 75 of the 100 squares is 0.75, so $\frac{3}{4} = \frac{75}{100} = \mathbf{0.75}$.
- Q22.** (a) $\frac{1}{4} = \frac{25}{100} = \mathbf{0.25}$. (b) $\frac{1}{2} = \frac{50}{100} = \mathbf{0.5}$. (c) $\frac{3}{4} = \frac{75}{100} = \mathbf{0.75}$.
- Q23.** (a) $\frac{1}{5} = \frac{2}{10} = \mathbf{0.2}$. (b) $\frac{2}{5} = \frac{4}{10} = \mathbf{0.4}$. (c) $\frac{3}{5} = \frac{6}{10} = \mathbf{0.6}$.
- Q24.** The dot is on $\frac{4}{10}$. Two tenths make one fifth, so $\frac{4}{10} = \frac{2}{5}$, and 4 tenths is written **0.4**.
- Q25.** $\frac{2}{4} = \frac{1}{2}$, and half a metre is **50 cm**, written **0.5** metres.

Q26. 0.75 is 75 hundredths, and 75 of the 100 squares is 3 quarters: $\frac{3}{4}$.

Q27. (a) $\frac{1}{4}$ of 12 is **3**, because $12 \div 4 = 3$. (b) $\frac{1}{3}$ of 12 is **4**, because $12 \div 3 = 4$. The array shows both boxes.

Q28. (a) $20 \div 4 = \mathbf{5}$, so $\frac{1}{4}$ of 20 is 5. (b) $20 \div 5 = \mathbf{4}$, so $\frac{1}{5}$ of 20 is 4.

Q29. 0.5 is a half, so circle $\frac{1}{2}$, $\frac{2}{4}$, $\frac{5}{10}$ **and** $\frac{4}{8}$. $\frac{3}{5}$ is 0.6, not 0.5.

Q30. False. The whole metre is 100 cm, and $100 \div 10 = 10$, so $\frac{1}{10}$ of a metre is 10 cm, not 1 cm.

Q31. (a) 1 of 4 equal parts is $\frac{1}{4}$, which is $100 \div 4 = 25$ cm, written **0.25 metres**. (b) 2 of 8 equal parts is $\frac{2}{8}$. Cutting each quarter of part (a) in half gives exactly these 2 eighths, so $\frac{2}{8} = \frac{1}{4}$ — **the same length**. (c) Each quarter becomes 2 eighths, so 3 quarters become $3 \times 2 = 6$ eighths: $\frac{6}{8}$. (d) 0.5 is 5 tenths, which is $\frac{1}{2}$ of the metre (also $\frac{2}{4}$, $\frac{4}{8}$ or $\frac{5}{10}$).

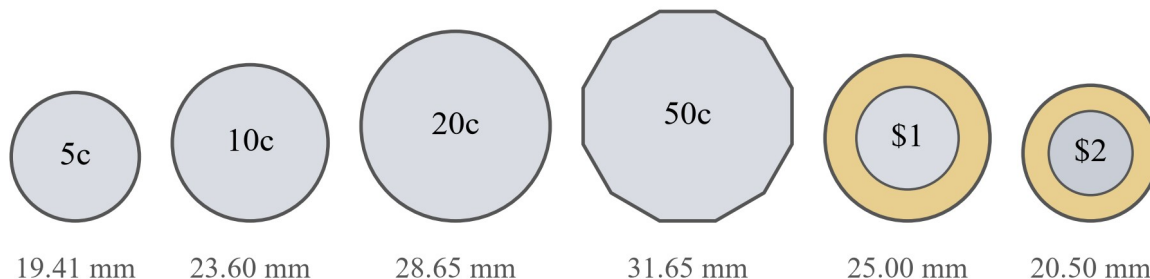
Purchases and change to the nearest 5 cents

Code **VC2M4N08** (Victorian Curriculum F–10 Version 2.0, Mathematics, Level 4; authority file `maths_4.json`): “solve problems involving purchases and the calculation of change to the nearest 5 cents with and without digital tools”. This section draws on `VC2M4N08.E01` and `.E02`.

What you need to know

In Year 3 you read and wrote dollars and cents, and you found change by counting on. Here that work meets real shopping: totals, rounding, and change, with and without digital tools.

Australian money. The coins you can use today are 5c, 10c, 20c, 50c, \$1 and \$2.



Australia's six coins in a row at their real sizes: 5c, 10c, 20c, 50c (12-sided), \$1 and \$2, with a number under each coin showing how wide it is.

Source: Royal Australian Mint, *About Australian coins*, ramint.gov.au, retrieved 2026-08-20.

The notes you can use are \$5, \$10, \$20, \$50 and \$100.



Australia's five banknotes in a row: \$5, \$10, \$20, \$50 and \$100.

Source: Reserve Bank of Australia, *In a Nutshell*, rba.gov.au, retrieved 2026-08-20.

No 1-cent or 2-cent coins. Australia stopped using the 1-cent and 2-cent coins in 1992, so a cash total like \$3.63 cannot be paid exactly — there is no coin for the last 3c.

Source: Royal Australian Mint, *Fast facts*, ramint.gov.au, retrieved 2026-08-20.

Because of that, shops round a **cash** total to the nearest 5 cents. A **card** total is not rounded: the machine charges the exact amount.

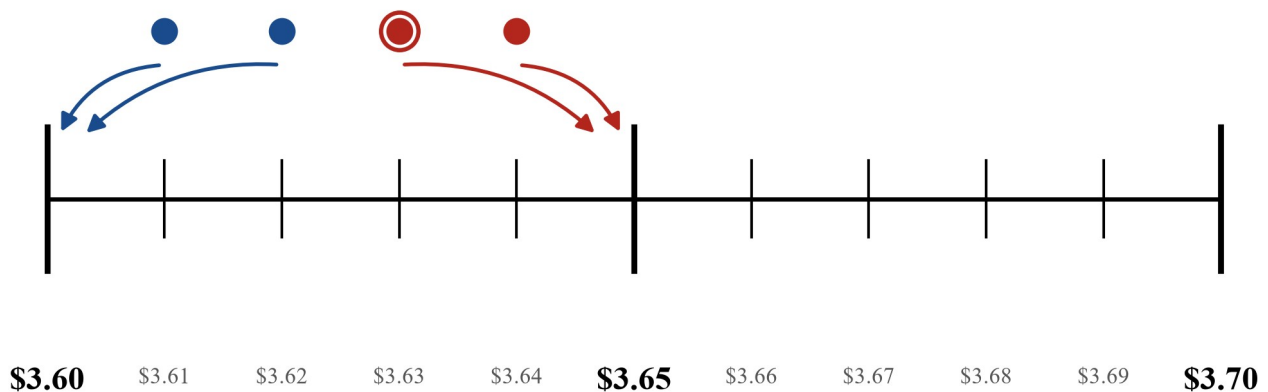
Rounding to the nearest 5 cents. The 5-cent steps are totals ending in 0c or 5c. Look at how far the total is past the step below it:

- 1c or 2c past a step → round **down** to that step.
- 3c or 4c past a step → round **up** to the next step.

ends in 1c or 2c → round down

ends in 3c or 4c → round up

a total of \$3.63



A number line from \$3.60 to \$3.70 with a tick at every cent. Dots on \$3.61 and \$3.62 arrow back to \$3.60, round down; dots on \$3.63 and \$3.64 arrow on to \$3.65, round up; the dot on \$3.63 is ringed.

On the number line, \$3.61 and \$3.62 sit close to \$3.60, so they round down. \$3.63 and \$3.64 sit close to \$3.65, so they round up. The ringed dot is a total of \$3.63: 3c past \$3.60, so it rounds up to **\$3.65**.

How you pay can change what the same shopping costs.

PAY BY CASH	
Notebook	\$2.47
Pencil	\$1.16
Total	\$3.63
You pay	\$3.65

rounded to the nearest 5 cents

PAY BY CARD	
Notebook	\$2.47
Pencil	\$1.16
Total	\$3.63
You pay	\$3.63

exact — no rounding

Two matching receipts for a notebook and a pencil: paying by cash rounds the total to \$3.65; paying by card charges the exact \$3.63.

The exact total is \$3.63. By cash you pay \$3.65, and by card you pay \$3.63. The difference is only ever 1c or 2c either way.

Change. Your change is the money you get back: what you hand over, take away the total. Two good ways to find it are counting on, and subtracting in columns. Both give the same answer, and a digital tool (like a calculator) gives it too.

Other currencies. Not every country uses dollars and cents. India uses **rupees**, and one rupee is 100 **paise** (one small part is a *paisa*).

Australia				India			
$\$1 = 100 \text{ cents}$				$\text{₹}1 = 100 \text{ paise}$			
$\$3.65$				$\text{₹}3.65$			
dollars	tenths	hundredths		rupees	tenths	hundredths	
3	6	5		3	6	5	

Both are decimal systems: 100 small parts make 1 whole.

Two cards side by side. Australia: \$1 = 100 cents, and \$3.65 set out in a place value table as 3, 6, 5. India: 1 rupee = 100 paise, and 3.65 rupees set out the same way as 3, 6, 5.

Source: Wikipedia, *Indian rupee*, en.wikipedia.org, retrieved 2026-08-20.

Notice the match: \$1 = 100 cents and ₹1 = 100 paise. Both currencies are decimal systems, so the adding and rounding you learn here works the same way in rupees and paise.

Worked examples

Example 1 — a cash purchase: rounding the total

A notebook costs \$2.47 and a pencil costs \$1.16. You pay by cash. Work out what you pay.

RECEIPT	
Notebook	\$2.47
Pencil	\$1.16
Total	\$3.63
Pay by cash	\$3.65
Pay by card	\$3.63
Cash rounds to the nearest 5 cents. Card does not round.	

A shop receipt: notebook \$2.47, pencil \$1.16, total \$3.63; pay by cash \$3.65; pay by card \$3.63.

Working

Add the prices: $\$2.47 + \$1.16 = \$3.63$.

$\$3.63$ is 3c past the $\$3.60$ step.

3c past $\rightarrow$ round up: $\$3.63 \rightarrow \3.65 .

Paying by cash, you pay **\$3.65**.

Comment

Line up the decimal points; add the cents first.

The steps either side are $\$3.60$ and $\$3.65$.

3c or 4c past a step rounds up.

Example 2 — change from \$10, without digital tools

A book costs $\$6.32$. You pay by cash with a $\$10$ note. Find the total you pay, then your change, two ways.

Working

$\$6.32$ is 2c past $\$6.30$, so it rounds down: you pay $\$6.30$.

Count on: $\$6.30 + 20\text{c} = \6.50 , $+ 50\text{c} = \$7$, $+ \$3 = \10 .

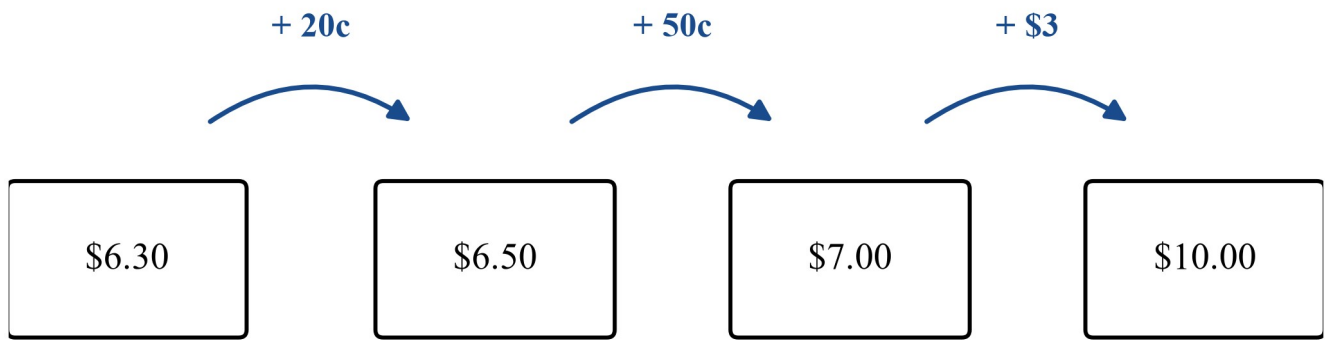
Change: $20\text{c} + 50\text{c} + \$3 = \$3.70$.

Comment

1c or 2c past a step rounds down.

Count on to the next easy amounts.

Add the jumps.



$$\text{Change: } 20c + 50c + \$3.00 = \$3.70$$

Counting on from \$6.30: add 20c to reach \$6.50, add 50c to reach \$7.00, add \$3 to reach \$10.00; the change is $20c + 50c + \$3.00 = \3.70 .

Working

Comment

Or subtract: $\$10.00 - \$6.30 = \$3.70$.

Change is what you hand over, take away the total.

regroup: $\$10.00 = 9 \text{ dollars and } 10 \text{ tenths}$

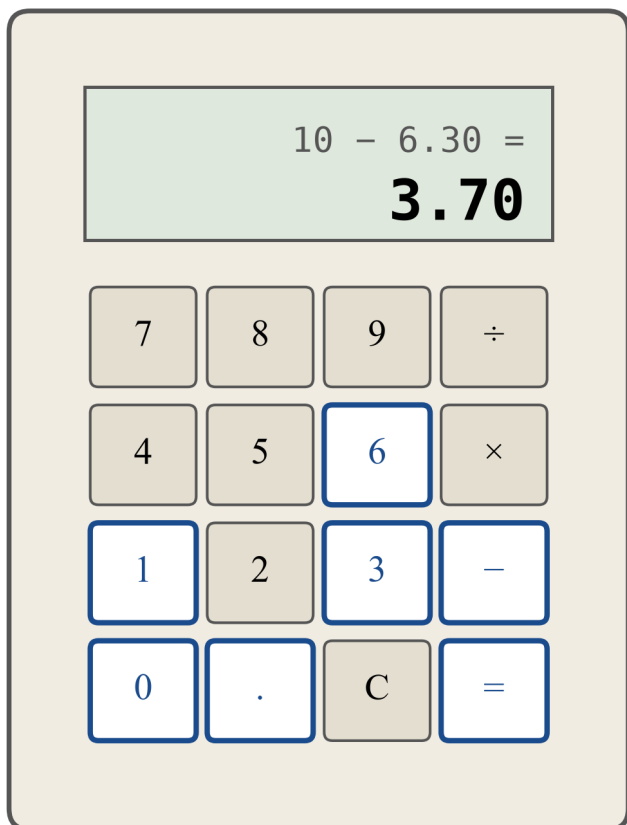
$$\begin{array}{r}
 \begin{array}{ccccccc}
 & & & \textcolor{red}{9} & & \textcolor{red}{10} & \\
 & & & \textcolor{red}{\curvearrowright} & & & \\
 \$ & 1 & 0 & . & 0 & 0 & \\
 - & & 6 & . & 3 & 0 & \\
 \hline
 \$ & & 3 & . & 7 & 0 &
 \end{array} \\
 \$10.00 - \$6.30 = \$3.70
 \end{array}$$

In columns, \$10.00 take away \$6.30 equals \$3.70; the renaming is shown in red above the columns.

Both ways give change of \$3.70.

Example 3 — checking the change with a digital tool

Check the change from Example 2 with a calculator.



A calculator finds the same change: \$3.70

A calculator with the keys 1, 0, take away, 6, point, 3, 0, equals pressed, showing $10 - 6.30 = 3.70$.

Working

Comment

Key in $10 - 6.30 =$ and the display shows 3.70.

The calculator works in dollars and cents just like columns do.

The display matches the pencil answer, \$3.70.

A digital tool is a check, and a way of working on its own.

With a card there is no rounding at all: the machine would charge the exact \$6.32. Cash rounds to the nearest 5 cents; card does not.

The calculator gives change of **\$3.70**, the same as counting on and as columns.

Practice questions

Rounding and paying: questions with help

Q1. Use the number line in your head. Are these totals closer to \$4.60 or to \$4.65? Round each to the nearest 5 cents.

- (a) \$4.61
- (b) \$4.62

Q2. The same two, closer to \$4.65 this time. Round each to the nearest 5 cents.

- (a) \$4.63
- (b) \$4.64

Q3. Round each total to the nearest 5 cents. The steps either side are \$7.80 and \$7.85.

- (a) \$7.81
- (b) \$7.84

Q4. Circle the totals that **change** when you pay by cash.

\$5.20 \$5.23 \$5.25 \$5.28

Q5. A drink costs \$3.20. You pay with a \$5 note. Fill in the jumps, then the change.

\$3.20 + ____ = \$4 \$4 + ____ = \$5 Change = ____

Q6. A total rounds down to \$6.30 and you pay with a \$10 note. Fill in the jumps, then the change.

\$6.30 + 20c = \$6.50 \$6.50 + ____ = \$7 \$7 + ____ = \$10 Change = ____

Q7. In India, a pen costs ₹2.30 and a ruler costs ₹1.45. Add them the way you add dollars and cents. What is the total?

Q8. A total is \$5.23. How much do you pay?

- (a) by cash
- (b) by card

Questions on your own

Q9. Round each to the nearest 5 cents.

- (a) \$2.31
- (b) \$2.34
- (c) \$5.82
- (d) \$5.83

Q10. Round each to the nearest 5 cents.

- (a) \$9.11
- (b) \$9.14
- (c) 47c
- (d) 48c

Q11. Round each to the nearest 5 cents.

- (a) \$6.27
- (b) \$6.28
- (c) 96c
- (d) 99c

Q12. A notebook costs \$3.48 and a pencil case costs \$2.14. You pay by cash.

- (a) What is the exact total?
- (b) What does it round to?
- (c) What is your change from a \$10 note?

Q13. Stickers cost \$1.77 and an eraser costs \$2.86. You pay by cash with a \$5 note. What is your change?

Q14. Cards cost \$4.09 and markers cost \$3.64. You pay by cash with a \$10 note. What is your change?

Q15. A hat costs \$2.51, socks cost \$1.28 and a badge costs 94c. You pay by card.

- (a) What does the card charge?
- (b) Why is there no rounding?

Q16. Sam pays by cash for a total of \$8.83 and rounds it **down** to \$8.80. Is Sam right? Explain.

Q17. A cash total rounds to \$7.35. Write three exact totals it could have been.

Q18. Your change is \$3.70. Show two different ways the shopkeeper could hand it to you using notes and coins.

Q19. In India, you pay ₹5 for wool that costs ₹2.65. What is your change?

Q20. Mia has a \$10 note. A game costs \$6.84. She pays by cash. What does she pay, and what is her change?

Applied

Q21. In Ballarat, the town bus fares are shown on the fare board.

Town bus — one-way fares	
Single (adult)	\$3.00
Single (concession)	\$1.50

A town-bus fare board: single (adult) \$3.00; single (concession) \$1.50.

Source: Head, Transport for Victoria, *Victorian Regional Bus Fares Supplement* (from 1 January 2025), ptv.vic.gov.au, retrieved 2026-08-20. The concession fare is the cheaper fare for children and students.

Zoe is a child. She and her mum each buy a single fare, and Zoe's mum pays with a \$10 note.

- (a) What is the total for the two fares?
- (b) What change does Zoe's mum get?
- (c) Both fares end in 0c or 5c. Give a reason why bus fares are set that way.

Answers

Q1. (a) \$4.60 (b) \$4.60. **Q2.** (a) \$4.65 (b) \$4.65. **Q3.** (a) \$7.80 (b) \$7.85. **Q4.** \$5.23 (rounds to \$5.25) and \$5.28 (rounds to \$5.30); \$5.20 and \$5.25 stay as they are. **Q5.** 80c; \$1; change \$1.80. **Q6.** 50c; \$3; change \$3.70. **Q7.** ₹3.75. **Q8.** (a) \$5.25 (b) \$5.23. **Q9.** (a) \$2.30 (b) \$2.35 (c) \$5.80 (d) \$5.85. **Q10.** (a) \$9.10 (b) \$9.15 (c) 45c (d) 50c. **Q11.** (a) \$6.25 (b) \$6.30 (c) 95c (d) \$1. **Q12.** (a) \$5.62 (b) \$5.60 (c) \$4.40. **Q13.** 35c. **Q14.** \$2.25. **Q15.** (a) \$4.73 (b) card totals are exact — only cash rounds. **Q16.** No; \$8.83 is 3c past \$8.80, and 3c past rounds up, to \$8.85. **Q17.** Any three of \$7.33, \$7.34, \$7.35, \$7.36, \$7.37. **Q18.** For example: $\$2 + \$1 + 50\text{c} + 20\text{c}$, or $\$2 + \$1 + 50\text{c} + 10\text{c} + 10\text{c}$. (Others are possible.) **Q19.** ₹2.35. **Q20.** She pays \$6.85; change \$3.15. **Q21.** (a) \$4.50 (b) \$5.50 (c) cash totals are rounded to the nearest 5 cents, so fares are set on the 5-cent steps and never need rounding.

Worked answers

Q1. (a) \$4.61 is 1c past \$4.60, so it rounds down to **\$4.60**. (b) \$4.62 is 2c past, so it rounds down to **\$4.60**.

Q2. (a) \$4.63 is 3c past \$4.60, so it rounds up to **\$4.65**. (b) \$4.64 is 4c past, so it rounds up to **\$4.65**.

Q3. (a) \$7.81 is 1c past \$7.80: down to **\$7.80**. (b) \$7.84 is 4c past \$7.80: up to **\$7.85**.

Q4. \$5.20 and \$5.25 already end in 0c or 5c, so cash pays them as they are. **\$5.23** changes (up to \$5.25) and **\$5.28** changes (up to \$5.30).

Q5. $\$3.20 + 80\text{c} = \4 , and $\$4 + \$1 = \$5$. Change: $80\text{c} + \$1 = \textbf{\$1.80}$.

Q6. $\$6.50 + 50\text{c} = \7 , and $\$7 + \$3 = \$10$. Change: $20\text{c} + 50\text{c} + \$3 = \textbf{\$3.70}$.

Q7. Rupees and paise add like dollars and cents: $\text{₹}2.30 + \text{₹}1.45 = \textbf{₹3.75}$.

Q8. (a) Cash rounds: \$5.23 is 3c past \$5.20, up to **\$5.25**. (b) Card is exact: **\$5.23**.

Q9. (a) 1c past → **\$2.30**. (b) 4c past → **\$2.35**. (c) 2c past → **\$5.80**. (d) 3c past → **\$5.85**.

Q10. (a) 1c past \$9.10 → **\$9.10**. (b) 4c past → **\$9.15**. (c) 47c is 2c past 45c → **45c**. (d) 48c is 3c past 45c → **50c**.

Q11. (a) \$6.27 is 2c past \$6.25 → **\$6.25**. (b) \$6.28 is 3c past → **\$6.30**. (c) 96c is 1c past 95c → **95c**. (d) 99c is 4c past 95c → up to 100c, which is **\$1**.

Q12. (a) $\$3.48 + \$2.14 = \textbf{\$5.62}$. (b) 2c past \$5.60 → down to **\$5.60**. (c) $\$10 - \$5.60 = \textbf{\$4.40}$.

Q13. $\$1.77 + \$2.86 = \$4.63$; cash rounds up to \$4.65; $\$5 - \$4.65 = \textbf{35c}$.

Q14. $\$4.09 + \$3.64 = \$7.73$; cash rounds up to \$7.75; $\$10 - \$7.75 = \textbf{\$2.25}$.

Q15. (a) $\$2.51 + \$1.28 + 94\text{c} = \textbf{\$4.73}$. (b) Only **cash** totals are rounded to the nearest 5 cents; a card total is charged exactly.

Q16. Sam is **not right**. \$8.83 is 3c past \$8.80, and 3c past a step rounds up, so the cash total is \$8.85, not \$8.80.

Q17. Totals that round to \$7.35 are \$7.33 and \$7.34 (rounding up) and \$7.36 and \$7.37 (rounding down), as well as \$7.35 itself. Any three of these.

Q18. Two ways of making \$3.70: $\$2 + \$1 + 50\text{c} + 20\text{c}$, and $\$2 + \$1 + 50\text{c} + 10\text{c} + 10\text{c}$. Checks: $2 + 1 + 0.50 + 0.20 = 3.70$, and $2 + 1 + 0.50 + 0.10 + 0.10 = 3.70$.

Q19. $\text{₹}5 - \text{₹}2.65 = \textbf{₹2.35}$, worked like dollars and cents.

Q20. \$6.84 is 4c past \$6.80, so cash rounds up: Mia pays **\$6.85**. Change: $\$10 - \$6.85 = \textbf{\$3.15}$.

Q21. (a) $\$3 + \$1.50 = \textbf{\$4.50}$. (b) $\$10 - \$4.50 = \textbf{\$5.50}$. (c) Cash totals are rounded to the nearest 5 cents, so fares set on the 5-cent steps are always the exact cash amount — no rounding needed at the fare box.

Modelling practical problems, including financial contexts

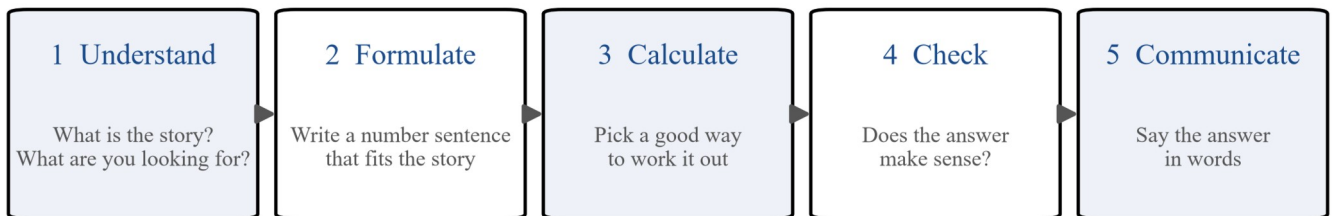
Code VC2M4N09 (Victorian Curriculum F–10 Version 2.0, Mathematics, Level 4; authority file `maths_4.json`): “use mathematical modelling to solve practical problems that involve additive and multiplicative situations, including financial contexts; formulate the problems using number sentences and choose efficient calculation strategies, using digital tools where appropriate; interpret and communicate solutions in terms of the situation”. This section draws on elaborations VC2M4N09.E01, .E02, .E03, .E04 and .E05.

What you need to know

You already add, subtract, multiply and divide. In this section you use those skills on real problems — shopping, fares, a party budget and sharing — and you learn a routine that works every time.

The modelling routine. A practical problem is a story with a question in it. Modelling means turning the story into maths, then turning the maths back into an answer the story can use.

A routine for modelling a practical problem

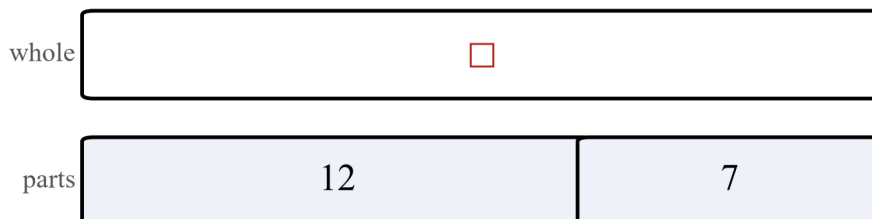


Five boxes joined by arrows, left to right: 1 Understand (What is the story? What are you looking for?), 2 Formulate (Write a number sentence that fits the story), 3 Calculate (Pick a good way to work it out), 4 Check (Does the answer make sense?), 5 Communicate (Say the answer in words).

Every example and question in this section uses these five steps. The two big families of problems are **additive** (putting parts together or taking a part away) and **multiplicative** (equal groups).

Additive problems: the bar model. A bar model draws the **whole** as one bar and the **parts** under it.

The parts are known, the whole is missing



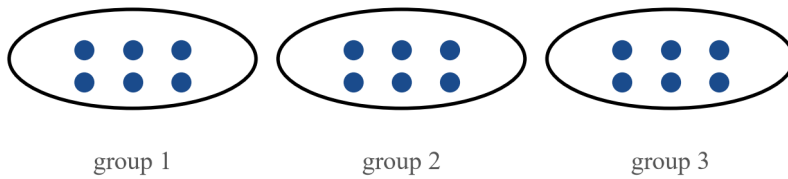
A bar model. The whole bar is a box marked with a square symbol. Under it are two part bars labelled 12 and 7. The caption says the parts are known and the whole is missing.

- When the **whole** is missing, **add** the parts: $12 + 7 = 19$.
- When a **part** is missing, **subtract**: take the known part from the whole.

The box, □, stands for the number you do not know yet.

Multiplicative problems: equal groups. When every group holds the same amount, a picture of the groups is the model.

$$3 \text{ groups of } 6 = 3 \times 6 = 18$$

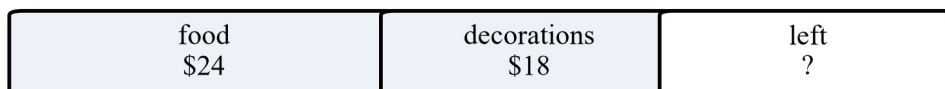


Three circles labelled group 1, group 2 and group 3, each holding 6 blue dots. The caption reads 3 groups of 6 = $3 \times 6 = 18$.

- When the **total** is missing, **multiply**: 3 groups of 6 is $3 \times 6 = 18$.
- When the **number in each group** is missing, **divide**: 18 shared into 3 equal groups is $18 \div 3 = 6$.

Money: choose the operation, then say why. The same money story can need adding, subtracting, multiplying or dividing. Part of modelling is saying *why* your operation fits the story. A **budget** — a plan for money you will spend — is a good bar model: what is spent plus what is left equals the whole budget.

the whole budget: \$60



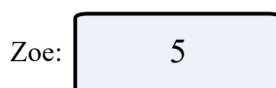
what is spent + what is left = the whole budget

A budget bar for \$60 in three parts: food \$24, decorations \$18, and a part labelled left with a question mark. The caption says what is spent plus what is left equals the whole budget.

Here the whole is \$60 and two parts are known, so subtract twice: $60 - 24 = 36$, then $36 - 18 = 18$. There is **\$18 left**.

Comparing with ‘times as many’. When one amount is some *times as many* as another, the model is one bar and a row of copies of it.

“4 times as many” means 4 copies of Zoe’s 5 goals



Two bars. Zoe’s bar is one box labelled 5. Marcus’s bar is 4 boxes each labelled 5, with $4 \times 5 = 20$ at the end. The caption says 4 times as many means 4 copies of Zoe’s 5 goals.

Zoe kicked 5 goals. Marcus kicked 4 times as many, so Marcus kicked $4 \times 5 = 20$ goals.

Digital tools. This content description lets you use digital tools where appropriate — a calculator is a good way to *check* a money calculation once your number sentence is written. You might use the free Windows Calculator on a computer, or the calculator on a school device. The tool checks the calculating; the modelling is still yours.

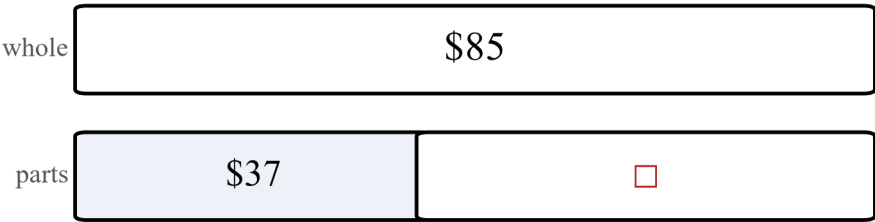
Source: Microsoft, Windows Calculator, github.com/microsoft/calculator, retrieved 2026-08-20.

Worked examples

Example 1 — step by step: a missing part on a bar model

Noah is saving for a scooter that costs \$85. He has \$37 so far. How much more money does Noah need?

The whole and one part are known, the other part is missing



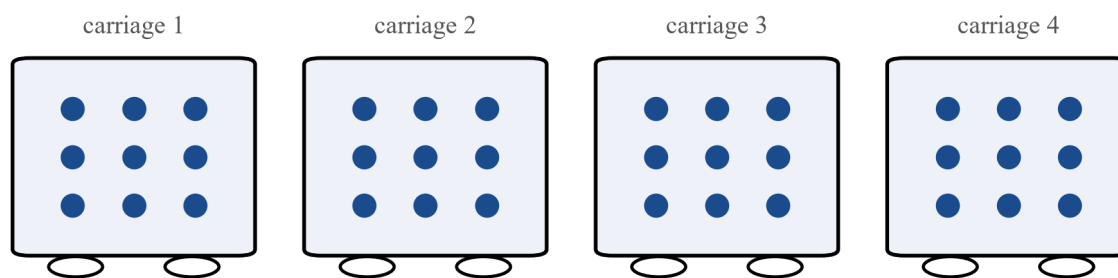
A bar model. The whole bar is labelled \$85. Under it are two part bars: one labelled \$37 and one marked with a square symbol. The caption says the whole and one part are known and the other part is missing.

Working	Comment
Whole: \$85. Known part: \$37. Missing part: □.	The bar model shows what the story tells us and what it asks for.
Number sentence: $85 - 37 = \square$.	A part is missing, so subtract the known part from the whole.
$85 - 30 = 55$, then $55 - 7 = 48$.	Partitioning the 37 makes the subtracting easy to do in your head.
Check: $37 + 48 = 85$. ✓	The two parts must add back to the whole. They do.
Noah needs \$48 more to buy the scooter.	

Example 2 — step by step: sharing equally into groups

A Year 4 class in Melbourne travels by train. All 36 students share equally into 4 carriages. How many students are in each carriage?

36 students shared equally into 4 carriages



$$36 \div 4 = 9 \text{ students in each carriage}$$

Four train carriages in a row, each holding 9 blue dots in a 3 by 3 square. The caption reads 36 students shared equally into 4 carriages, and below in red, $36 \div 4 = 9$ students in each carriage.

Working

36 students, shared into 4 equal groups.

Number sentence: $36 \div 4 = \square$.

$36 \div 4 = 9$.

Check: $4 \times 9 = 36$. ✓

There are **9 students** in each carriage.

Comment

The diagram shows what is unknown: the number in each group.

Dividing the total by the number of groups finds the number in each group.

The fact $4 \times 9 = 36$ gives the answer.

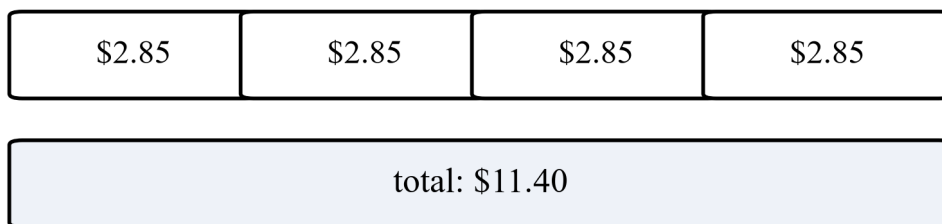
Multiplying back reaches the total again.

Example 3 — step by step: equal fares, and a rounding strategy

Four adults each touch on with myki for a 2-hour trip in Melbourne (Zone 1+2). The fare is \$2.85 each. What do the four fares cost altogether?

Source: Transport Victoria, *myki fares, Melbourne*, transport.vic.gov.au, retrieved 2026-08-20.

4 fares of \$2.85 each



$$4 \times \$2.85 = \$11.40$$

Four equal bars in a row, each labelled \$2.85, over one long bar labelled total: \$11.40. Below in red, $4 \times \$2.85 = \11.40 .

Working

4 equal fares of \$2.85.

Number sentence: $4 \times \$2.85 = \square$.

Round up: $\$2.85 \rightarrow \3 . Then $4 \times \$3 = \12 .

Take away the extra: $4 \times 15c = 60c$. $\$12 - 60c = \11.40 .

Comment

Equal amounts added together means multiplication fits the story.

The four fare bars together make the total bar.

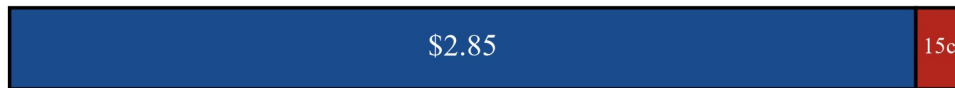
\$3 is the nearest easy dollar above \$2.85.

Each fare was rounded up by 15c, so 60c too much went in.

Check on a calculator: $4 \times 2.85 = 11.4$. ✓

A digital tool confirms the mental strategy.

round \$2.85 up to \$3



$$4 \times \$3 = \$12$$

take away the extra: $4 \times 15c = 60c$

$$\$12 - 60c = \$11.40$$

One bar split into a long blue part labelled \$2.85 and a short red part labelled 15c, with the caption round \$2.85 up to \$3. Below: $4 \times \$3 = \12 ; take away the extra, $4 \times 15c = 60c$; and in red, $\$12 - 60c = \11.40 .

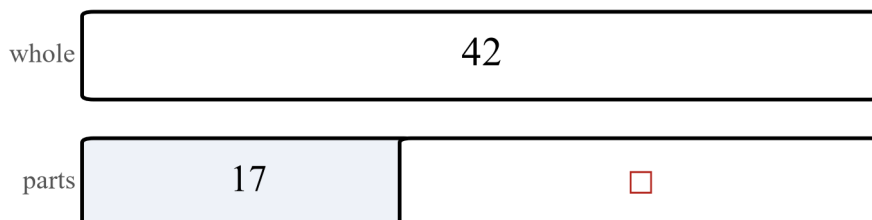
The four fares cost **\$11.40** altogether.

Practice questions

Questions with help

Q1. A bar model shows a whole of 42 and one part of 17. The other part is $\square$.

- (a) Is $\square$ the whole or a part?
- (b) Write a subtraction number sentence and find $\square$.

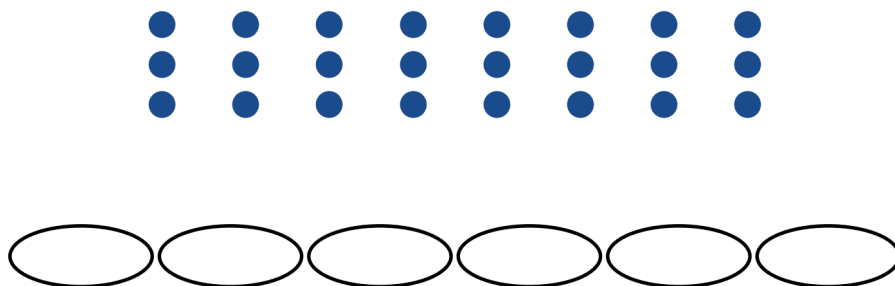


A bar model. The whole bar is labelled 42. Under it are two part bars: one labelled 17 and one marked with a square symbol.

Q2. Priya read 26 pages on Saturday and 35 pages on Sunday. How many pages did she read altogether? Draw a bar model first: which number is the whole?

Q3. Share 24 counters equally into the 6 circles. How many counters go into each circle? Write a division number sentence.

24 counters



A rectangle of 24 blue counters in 3 rows of 8, above 6 empty circles in a row. The caption reads 24 counters.

Q4. A shop sells pencils in packs of 8. Tom buys 5 packs. How many pencils is that? Draw 5 groups of 8, then write a multiplication number sentence.

Q5. Lena has \$50. She spends \$18 on a book. Which number sentence finds the money left: $50 + 18 = \square$ or $50 - 18 = \square$? Say why your choice fits the story.

Q6. Use the rounding strategy to find $3 \times \$4.95$. Fill in the gaps.

- (a) Round \$4.95 up to \$____. $3 \times \$______ = \15 .
- (b) Each \$4.95 was rounded up by ____c, so the extra is $3 \times ______ \text{c} = ______ \text{c}$.
- (c) $\$15 - ______ \text{c} = \$______$.

Q7. Ruby caught 6 fish. Her uncle caught 3 times as many. Draw a comparison model — one bar of 6 for Ruby, then 3 copies of it for her uncle — and write a number sentence for her uncle's fish.

Q8. A class party has a budget of \$40. They spend \$16 on food and \$11 on decorations. Draw a budget bar with three parts (food, decorations, left) and find how much is left.

Questions on your own

Q9. The canteen sold 127 pies in the first week of term and 158 in the second week. How many pies did it sell altogether?

Q10. A board game costs \$79. Kai has saved \$45. How much more money does Kai need?

Q11. Mia sticks 54 stickers equally onto 6 pages of her book. How many stickers are on each page?

Q12. A hall has 8 rows of chairs with 7 chairs in every row. How many chairs are there altogether?

Q13. A cup of hot chocolate at the canteen costs \$3.50. How much do 6 cups cost?

Q14. Jess pays for a \$13.40 lunch with a \$20 note. How much change does she get?

Q15. Sam writes $12 + 9 = \square$ for this story: *There are 12 boxes with 9 apples in each box. How many apples are there altogether?* Is his number sentence right? If not, write the correct one and find the answer.

Q16. Use the rounding strategy to find $5 \times \$5.95$. Show your jottings.

Q17. Jack's sunflower grew 12 cm in a month. Mia's grew 5 times as tall as Jack's in the same month. How tall is Mia's sunflower?

Q18. A club has a \$100 budget for a fun day. They spend \$36 on food and \$28 on games, and the rest on decorations. How much do they spend on decorations?

Q19. Dee says $5 \times \$2.85$ is \$14.45. Use the rounding strategy to show that her answer is wrong, and find the right one.

Q20. The number sentence $48 \div 6 = 8$ solves a story about sharing stickers equally between 6 friends. Write the story, and write the answer in a full sentence.

Applied

Q21. Grown-ups in a family travel by train in Melbourne (Zone 1+2) and touch on with myki. A 2-hour fare is \$2.85. On a weekend, the most anyone pays in one day is \$4.

Source: Transport Victoria, *myki fares, Melbourne*, transport.vic.gov.au, retrieved 2026-08-20.

- (a) On Friday, 6 adults each touch on for one 2-hour fare. Write a number sentence and find the total cost. The rounding strategy works well here.
 - (b) On Saturday, one of them touches on for three separate 2-hour trips. Three fares would be $3 \times \$2.85 = \8.55 — but the most anyone pays in a weekend day is \$4. How much does that person pay for the day?
 - (c) How much less is that than \$8.55?
 - (d) In one sentence, say why the weekend rule is good news for someone who makes many trips in a day.
-

Answers

Q1. (a) A part. (b) $42 - 17 = 25$. **Q2.** 61 pages. The whole is 61. **Q3.** 4 counters; $24 \div 6 = 4$. **Q4.** 40 pencils; $5 \times 8 = 40$. **Q5.** $50 - 18 = 32$; the money left is the whole with the spent part taken away. **Q6.** (a) \$5, \$5; (b) 5c, 5c, 15c; (c) 15c, \$14.85. **Q7.** 18 fish; $3 \times 6 = 18$. **Q8.** \$13 left. **Q9.** 285 pies. **Q10.** \$34. **Q11.** 9 stickers. **Q12.** 56 chairs. **Q13.** \$21. **Q14.** \$6.60. **Q15.** No; $12 \times 9 = 108$ apples. **Q16.** \$29.75. **Q17.** 60 cm. **Q18.** \$36. **Q19.** The right answer is \$14.25, not \$14.45. **Q20.** Answers will vary; see worked answer. **Q21.** (a) \$17.10; (b) \$4; (c) \$4.55; (d) answers will vary.

Worked answers

Q1. (a) The whole is 42, so $\square$ is **a part**. (b) A missing part means subtract: $42 - 17 = 25$. Check: $17 + 25 = 42$. ✓

Q2. The whole is missing, so add the parts: $26 + 35 = 61$. Priya read **61 pages** altogether. In the bar model, 61 is the whole bar over the 26 and 35 parts.

Q3. Dealing the counters one at a time puts **4** in each circle. The number sentence is $24 \div 6 = 4$. Check: $6 \times 4 = 24$. ✓

Q4. Five groups of 8 is $5 \times 8 = 40$. Tom buys **40 pencils**.

Q5. $50 - 18 = 32$. The \$50 is the whole; the \$18 spent is a part taken away, so the money left is the missing part. Adding would make the whole too big, which does not fit the story.

Q6. (a) Round \$4.95 up to **\$5**; $3 \times \$5 = \15 . (b) Each was rounded up by **5c**, so the extra is $3 \times 5c = 15c$. (c) $\$15 - 15c = \14.85 .

Q7. Her uncle's bar is 3 copies of 6: $3 \times 6 = 18$. Ruby's uncle caught **18 fish**.

Q8. What is spent plus what is left equals the whole budget: $16 + 11 = 27$ spent, then $40 - 27 = 13$. There is **\$13 left**. (Subtracting twice, $40 - 16 = 24$ then $24 - 11 = 13$, gives the same answer.)

Q9. The whole is missing: $127 + 158 = 285$. The canteen sold **285 pies**.

Q10. A part is missing: $79 - 45 = 34$. Kai needs **\$34** more.

Q11. The number in each group is missing: $54 \div 6 = 9$. There are **9 stickers** on each page.

Q12. Equal groups, total missing: $8 \times 7 = 56$. There are **56 chairs**.

Q13. Equal amounts added: $6 \times \$3.50$. Six lots of \$3 is \$18 and six lots of 50c is \$3, so $\$18 + \$3 = \$21$.

Q14. The change is the missing part: $20 - 13.40 = \$6.60$. Check: $13.40 + 6.60 = 20$. ✓

Q15. Not right. The boxes are equal groups, so the total is $12 \times 9 = 108$ **apples**, not $12 + 9 = 21$.

Q16. Round \$5.95 up to \$6: $5 \times \$6 = \30 . The extra is $5 \times 5c = 25c$. $\$30 - 25c = \29.75 .

Q17. 5 times as tall means 5 copies of 12 cm: $5 \times 12 = 60$. Mia's sunflower is **60 cm** tall.

Q18. The whole budget is \$100. Spent: $36 + 28 = 64$. Left for decorations: $100 - 64 = \$36$.

Q19. Round up: $5 \times \$3 = \15 . The extra is $5 \times 15c = 75c$. $\$15 - 75c = \14.25 . So the right answer is **\$14.25** — Dee's \$14.45 is 20c too much.

Q20. A story that fits: *48 stickers are shared equally between 6 friends. How many stickers does each friend get?* The answer in a full sentence: **Each friend gets 8 stickers.**

Q21. (a) 6 equal fares: $6 \times \$2.85$. Round up: $6 \times \$3 = \18 ; the extra is $6 \times 15c = 90c$; $\$18 - 90c = \17.10 . (b) Three fares would be \$8.55, but the most anyone pays in a weekend day is **\$4**, so that is what the person pays. (c) $\$8.55 - \$4 = \$4.55$ less. (d) Once you have paid \$4, every extra trip that day costs nothing, so people who make many trips pay less than the fares would cost one by one.

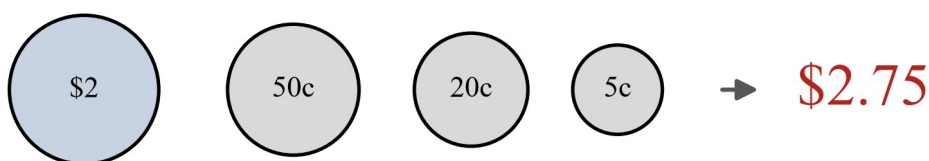
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- (c) Look at the decimal 3.47. (1 mark)
- (d) Which digit is in the tenths place?
- (ii) Which place is the 7 in?
- (iii) Rename. Fill in the boxes. (1 mark)

4 tenths = hundredths, so $0.4 = 0.\square\square$

- (e) Count these coins, and write the total in dollars and cents. (1 mark)

One \$2 coin, one 50c coin, one 20c coin and one 5c coin.



\$2.75 is 2 dollars and 75 hundredths of the next dollar
 the 7 means 7 tenths of a dollar, the 5 means 5 hundredths

Australian coins — one \$2 coin, one 50c coin, one 20c coin and one 5c coin.

Source: Royal Australian Mint, *Circulating coins*, ramint.gov.au, retrieved 2026-08-20.

Question 3 — Equivalent fractions, and the fraction–decimal connection (5 marks)

- (a) Which fraction names the same amount as $\frac{1}{2}$? (1 mark)

A	B	C	D
$\frac{3}{8}$	$\frac{4}{8}$	$\frac{3}{5}$	$\frac{4}{10}$

- (b) Cut each quarter in half. Fill in the missing number. (1 mark)

$$\frac{3}{4} = \frac{\square}{8}$$

- (c) Fill in the missing number. (1 mark)

$$\frac{1}{5} = \frac{2}{10} = 0.\square$$

- (d) A metre is 100 cm. $\frac{1}{4}$ of a metre is cm, which is 0. metres. (1 mark)

- (e) Fill in the missing numbers. (1 mark)

$\frac{1}{4}$ of 20 is , because $\square \div \square = \square$.

Question 4 — Purchases and change (5 marks)

- (a) A shop total is \$4.63. You pay by cash. How much do you pay? (1 mark)

A	B	C	D
\$4.60	\$4.63	\$4.65	\$4.70

- (b) A shop's exact total is \$8.72. How much do you pay (i) by cash, and (ii) by card? (1 mark)

(c) In Ballarat, the town bus fares are shown on the fare board.

Fare	Cost
Single (adult)	\$3.00
Single (concession)	\$1.50

Source: Head, Transport for Victoria, *Victorian Regional Bus Fares Supplement* (from 1 January 2025), ptv.vic.gov.au, retrieved 2026-08-20. The concession fare is the cheaper fare for children and students.

Zoe is a child. She and her mum each buy a single fare, and Zoe's mum pays with a \$10 note. **Work without digital tools for this part**, and show your working.

- (i) What is the total for the two fares? (1 mark)
- (ii) What change does Zoe's mum get? (1 mark)
- (iii) Now check your change from part (c) **with a calculator**. Write what you key in, and what the display shows. Does it match your answer to part (c)? (1 mark)

Question 5 — Modelling practical problems (5 marks)

- (a) A class has a \$70 budget for a party. They spend \$26 on food and \$19 on decorations, and the rest on games.
- [\$70 budget]
- [\$26 food][\$19 decorations][? games]

How much do they spend on games? Write a number sentence that fits the story. (1 mark)

- (b) The canteen packs 56 muffins into boxes. Each box holds 8 muffins. How many boxes are there? Write a division number sentence. (1 mark)
- (c) Use the rounding strategy to work out $4 \times \$4.95$. Show your working. (2 marks)
- (d) Leo kicked 7 goals in a football match. Marcus kicked 4 times as many. How many goals did Marcus kick? Write a number sentence. (1 mark)

Total: 25 marks

Solutions

Teacher-facing. Test T2 is a classroom check, not an exam: untimed in principle with a 30-minute guidance duration, materials supplied, and Question 4 worked both without digital tools (part c) and with a calculator (part d) per the CD wording of VC2M4N08 (“with and without digital tools”, D7).

Marking guide

Marks by item and CD. Only Chapter 2 CDs are assessed (§4); every Chapter 2 CD contributes at least one separately scored item.

Item	CD code	Subtopic	Type	Marks
Q1(a)	VC2M4N04	2A	MCQ (A–D)	1
Q1(b)–(e)	VC2M4N04	2A	Short answer	4
Q2(a)	VC2M4N01	2B	MCQ (A–D)	1
Q2(b)–(e)	VC2M4N01	2B	Short answer	4
Q3(a)	VC2M4N03	2C	MCQ (A–D)	1
Q3(b)–(e)	VC2M4N03	2C	Short answer	4
Q4(a)	VC2M4N08	2D	MCQ (A–D)	1
Q4(b)–(d)	VC2M4N08	2D	Short answer / worked response	4
Q5(a)–(d)	VC2M4N09	2E	Worked response	5
Total				25

MCQ total: 4 marks of 25 — inside the one-quarter cap of §7.

Rubrics, by CD. The achievement-standard extract for each CD is quoted verbatim from `maths_4.json`; rubrics score the strategy as well as the answer.

VC2M4N04 (2A) — 5 marks (Q1a 1, Q1b–e 4). *“Students count and represent familiar fractions on a number line.”*

Observable actions:

- continues the count by quarters past one whole — selects $\frac{5}{4}$ (1 mark);
- fills the missing elements of a count by thirds — $\frac{3}{3}$, $\frac{4}{3}$ (1 mark);
- renames an improper fraction as a mixed numeral — $\frac{7}{4} = 1\frac{3}{4}$ (1 mark);
- renames a mixed numeral as an improper fraction — $2\frac{1}{2} = \frac{5}{2}$ (1 mark);
- represents a mixed numeral on a number line — dot at $2\frac{1}{4}$, 9 quarter-jumps from 0 (1 mark).

VC2M4N01 (2B) — 5 marks (Q2a 1, Q2b–e 4). *“students use their understanding of place value to represent tenths and hundredths in decimal form and to multiply natural numbers by multiples of 10.”* This extract is shared with VC2M4N05; T2 observes the tenths-and-hundredths representation, and the multiplication-by-multiples-of-10 half is scored in T1 through 1B. Observable actions:

- selects the decimal that shows six tenths — 0.6 (1 mark);
- reads tenths from a bar and writes the decimal — 0.7 (1 mark);
- names the tenths and hundredths places in 3.47 — the digit 4; the hundredths place (1 mark);
- renames tenths as hundredths — 40 hundredths; $0.4 = 0.40$ (1 mark);
- uses place value to write a mixed coin total in decimal form — \$2.75 (1 mark).

VC2M4N03 (2C) — 5 marks (Q3a 1, Q3b–e 4). *“They recognise common equivalent fractions in familiar contexts and make connections between fraction and decimal notations.”* Observable actions:

- recognises $\frac{4}{8}$ as equivalent to $\frac{1}{2}$ — selects B (1 mark);
- finds an equivalent fraction with a related denominator — $\frac{3}{4} = \frac{6}{8}$ (1 mark);
- connects fifths and tenths to decimal notation — $\frac{1}{5} = \frac{2}{10} = 0.2$ (1 mark);
- connects a fraction of a metre to decimal notation — $\frac{1}{4}$ of a metre is 25 cm, 0.25 metres (1 mark);
- connects a fraction of a collection to division — $\frac{1}{4}$ of 20 is 5; $20 \div 4 = 5$ (1 mark).

VC2M4N08 (2D) — 5 marks (Q4a 1, Q4b–d 4). “Students use mathematical modelling to solve financial and other practical problems, formulating the problem using number sentences, solving the problem choosing efficient strategies and interpreting the results in terms of the situation.” The CD text adds that this is done “with and without digital tools”; Q4(c) is worked without digital tools and Q4(d) checks the same change with a calculator, so both forms appear (D7). Observable actions:

- rounds a cash total to the nearest 5 cents — selects \$4.65 (1 mark);
- interprets the result in terms of the situation — \$8.70 by cash, \$8.72 by card (1 mark);
- formulates and solves a purchase problem without digital tools — total \$4.50 (1 mark); change \$5.50 with working shown (1 mark);
- checks the change with a digital tool — keys in $10 - 4.50$, reads 5.50 on the display, and says it matches (1 mark).

VC2M4N09 (2E) — 5 marks (Q5). “Students use mathematical modelling to solve financial and other practical problems, formulating the problem using number sentences, solving the problem choosing efficient strategies and interpreting the results in terms of the situation.” Observable actions:

- reads the budget bar and subtracts the known parts from the whole, with a number sentence that fits the story — $70 - 26 = 44$ and $44 - 19 = 25$; \$25 on games (1 mark);
- divides to find the number of groups and writes the number sentence — $56 \div 8 = 7$ boxes (1 mark);
- chooses and applies the rounding-up strategy — $4 \times \$5 = \20 , take away $4 \times 5c = 20c$ (1 mark); answer \$19.80 (1 mark);
- models “times as many” and writes the number sentence — $4 \times 7 = 28$ goals (1 mark).

MCQ key. Q1a **A** · Q2a **B** · Q3a **B** · Q4a **C**. One mark per correct letter; no part marks.

General marking notes.

- Worked-response marks (Q4c–d, Q5a–d) need working shown. For Q5(c), 1 mark is for the rounding strategy shown and 1 mark for the answer; a correct answer with no working earns 1 mark only.
- Accept any correct method shown: counting on or a subtraction number sentence for change in Q4(c); subtracting the two spends in either order, or subtracting their sum, in Q5(a).
- The two bus fares already land on a 5-cent step (\$4.50), so no rounding is needed in Q4(c); accept answers that say so as well as answers that simply add.
- Q1(e): the 1 mark needs both — the dot at $2\frac{1}{4}$ (one quarter of the way from 2 to 3) and 9 quarter-jumps.
- Accept \$2.75 for Q2(e); “275c” is not the dollars-and-cents form the question asks for.
- Unknowns are shown with $\square$, never with a letter — there are no pronumerals in this book.

Answer key

Q	Part	Answer	Marks
1	(a)	A ($\frac{3}{4}$)	1
1	(b)	$\frac{3}{3}$, $\frac{4}{3}$	1
1	(c)	$1\frac{3}{4}$	1
1	(d)	$\frac{5}{2}$	1
1	(e)	Dot at $2\frac{1}{4}$ (between 2 and 3); 9 quarter-jumps	1
2	(a)	B (0.6)	1
2	(b)	0.7	1
2	(c)	(i) 4 (ii) the hundredths place	1
2	(d)	40 hundredths; $0.4 = 0.40$	1

Q	Part	Answer	Marks
2	(e)	\$2.75	1
3	(a)	B ($\frac{4}{8}$)	1
3	(b)	$6 - \frac{3}{4} = \frac{6}{8}$	1
3	(c)	0.2	1
3	(d)	25 cm; 0.25 metres	1
3	(e)	$5; 20 \div 4 = 5$	1
4	(a)	C (\$4.65)	1
4	(b)	(i) \$8.70 (ii) \$8.72	1
4	(c)	(i) \$4.50 (ii) \$5.50, working shown	2
4	(d)	$10 - 4.50$ keyed; display 5.50; matches	1
5	(a)	\$25; e.g. $70 - 26 = 44$, then $44 - 19 = 25$	1
5	(b)	7 boxes; $56 \div 8 = 7$	1
5	(c)	\$19.80, rounding strategy shown	2
5	(d)	28 goals; $4 \times 7 = 28$	1

Worked solutions

Q1. (a) Each step of the count by quarters adds one quarter: $\frac{1}{4}, \frac{2}{4}, \frac{3}{4}, \frac{4}{4}$, and the count does not stop at one whole — $\frac{4}{4}$ is 1 whole, so the next quarter is five-quarters, $\frac{5}{4}$ (also $1\frac{1}{4}$). B is wrong because 1 is where $\frac{4}{4}$ already sits; C and D are not quarter counts. The answer is **A**.

(b) Each step adds one third: $\frac{1}{3}, \frac{2}{3}, \frac{3}{3}, \frac{4}{3}, \frac{5}{3}$. ($\frac{3}{3}$ is 1 whole.)

(c) Four quarters make one whole. Seven quarters is one group of 4 quarters with 3 left over, so $\frac{7}{4} = 1\frac{3}{4}$.

(d) Two wholes are 4 halves; count on one more half: $2\frac{1}{2} = \frac{5}{2}$.

(e) From 0, two wholes is 8 quarter-jumps, and one more quarter-jump makes 9. The dot sits at $2\frac{1}{4}$ — **between 2 and 3**, one quarter of the way from 2 to 3. **9 quarter-jumps** from 0.

Q2. (a) Six tenths puts 6 in the tenths place, just after the decimal point: **0.6**. 0.06 is six hundredths, 6.0 is six ones, and 0.16 is sixteen hundredths. The answer is **B**.

(b) The bar is the whole in 10 equal pieces, and 7 are shaded: 7 tenths, written **0.7**.

(c) 3.47 is 3 ones, 4 tenths and 7 hundredths. (i) The digit in the tenths place is **4**.

(ii) The 7 is in the **hundredths place**.

(iii) One tenth is the same as 10 hundredths, so 4 tenths is **40** hundredths: $0.4 = \mathbf{0.40}$. Renaming does not change the amount.

(e) Whole dollars: the \$2 coin gives \$2. Cents: $50c + 20c + 5c = 75c$. The total is **\$2.75** — the 7 means 7 tenths of a dollar and the 5 means 5 hundredths.

Q3. (a) Cut $\frac{1}{2}$ into eighths and it fills 4 of the 8 parts, so $\frac{1}{2} = \frac{4}{8}$. $\frac{3}{8}$ is one piece short, and $\frac{3}{5}$ ($= \frac{6}{10}$) and $\frac{4}{10}$ are not $\frac{1}{2}$. The answer is **B**.

(b) Cut each of the 3 shaded quarters in half: 4 parts become 8 parts, and $3 \times 2 = 6$ shaded eighths. $\frac{3}{4} = \frac{6}{8}$; the missing number is **6**.

(c) One fifth lines up with two tenths, and 2 tenths is written **0.2**: $\frac{1}{5} = \frac{2}{10} = 0.2$.

(d) The whole metre is 100 cm, and $100 \div 4 = 25$, so $\frac{1}{4}$ of a metre is **25 cm**. Twenty-five hundredths of a metre is written **0.25** metres.

(e) Split 20 into 4 equal parts: $20 \div 4 = 5$, so $\frac{1}{4}$ of 20 is **5**.

Q4. (a) \$4.63 is 3c past the \$4.60 step. 3c or 4c past a step rounds up, so the cash amount is \$4.65. The answer is **C**.

(b) \$8.72 is 2c past the \$8.70 step, and 1c or 2c past rounds down: by cash you pay **\$8.70**. A card total is not rounded, so by card you pay the exact **\$8.72**.

(c)

(i) Zoe rides on the concession fare (\$1.50) and her mum on the adult fare (\$3.00): $\$3.00 + \$1.50 = \$4.50$. The total already ends in 0c, so no rounding is needed.

(ii) Count on from \$4.50 to \$10: $\$4.50 + 50\text{c} = \5 , and $\$5 + \$5 = \$10$, so the change is $50\text{c} + \$5 = \5.50 . (A subtraction gives the same answer: $\$10.00 - \$4.50 = \$5.50$.)

(iii) Key in $10 - 4.50 =$. The display shows **5.5**, which is \$5.50 — **it matches** the answer to part (c).

Q5. (a) The whole budget is \$70; the parts are food \$26, decorations \$19 and games $\square$. What is spent plus what is left equals the whole, so subtract the known parts: $70 - 26 = 44$, then $44 - 19 = 25$. They spend **\$25** on games. ($70 - (26 + 19) = 25$ is the same sentence another way.) Check: $26 + 19 + 25 = 70$. ✓

(b) The number in each group is known (8 muffins per box) and the number of groups is missing, so divide: $56 \div 8 = 7$. There are **7 boxes**. Check: $7 \times 8 = 56$. ✓

(c) Round \$4.95 up to \$5: $4 \times \$5 = \20 . Each price was rounded up by 5c, so take away the extra: $4 \times 5\text{c} = 20\text{c}$. $\$20 - 20\text{c} = \19.80 . (Check with a calculator if you like: $4 \times 4.95 = 19.8$.)

(d) Four times as many means 4 copies of 7 goals: $4 \times 7 = 28$. Marcus kicked **28 goals**.