

YEAR 7 • MATHEMATICS • NUMBER AND ALGEBRA

WA CURRICULUM (SCSA) • UNDERSTANDING NUMBER

Fractions, Decimals and Percentages

Move confidently between the three forms, explain why they describe the same amount, and test calculator methods for converting between them.

WA7MNAUN2

NAME _____	CLASS _____	DATE _____	MARK / 100
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Instructions. Complete Sections A to C **without a calculator**. Question 21 requires a calculator, and one may be used in Section E. Show all working — marks are given for the conversions you use, not only for the final answer. Write every fraction in its simplest form unless told otherwise.

A

Seeing percentages

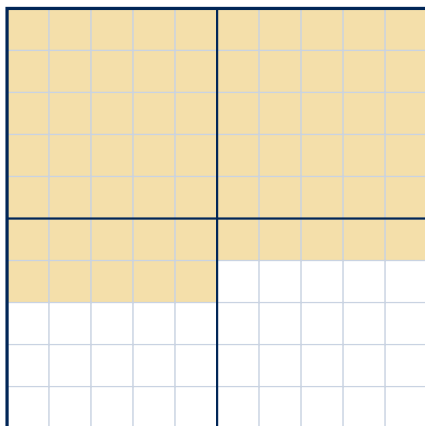
Each large square is divided into 100 equal parts.

QUESTIONS 1–5

1

4 mk

The hundred square below has 65 of its 100 small squares shaded.



(a) What **percentage** of the square is shaded?

(b) Write the shaded amount as a fraction with denominator

100.

$\frac{\quad}{100}$

(c) Write the shaded amount as a **decimal**.

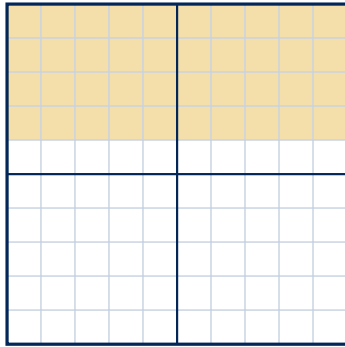
(d) Write the fraction in its **simplest form**.

Now complete the chain: $65\% = \underline{\quad} = \frac{65}{100} = \underline{\quad}$

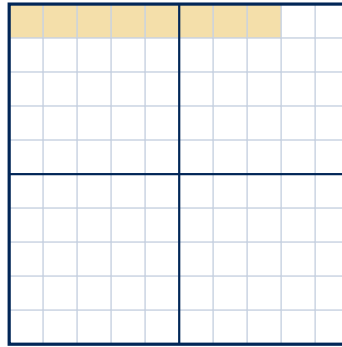
2

3 mk

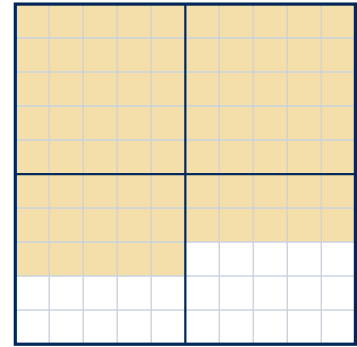
Write the shaded amount of each square as a percentage, a decimal, and a fraction in simplest form.



Square A



Square B



Square C

(a) A _____

(b) B _____

(c) C _____

3

4 mk

The number line below is labelled in percentages above and decimals below.



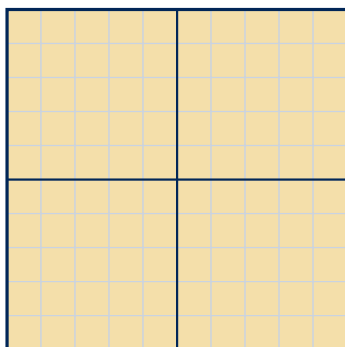
(a) Mark and label 0.25 , $\frac{1}{2}$, 70% and $\frac{9}{10}$ on the line.

(b) Complete: $0.25 = \underline{\hspace{1cm}}\%$ $\cdot \frac{1}{2} = \underline{\hspace{1cm}}$ $\cdot 70\% = \underline{\hspace{1cm}}$ $\cdot \frac{9}{10} = \underline{\hspace{1cm}}\%$

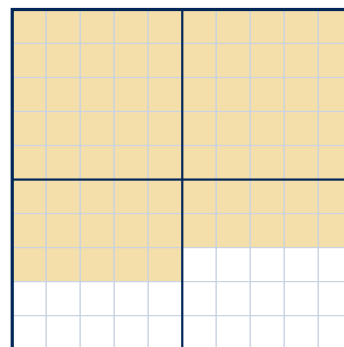
4

4 mk

One whole square is fully shaded and 75 squares of a second are shaded.



one whole



part of a second

(a) What percentage is shaded altogether?

(b) Write that as a decimal.

(c) Write it as a mixed number.

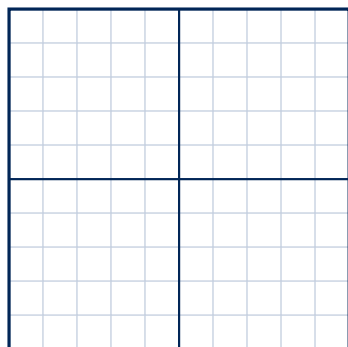
(d) Write it as an improper fraction.

Complete: $100\% = 1$, so $175\% = \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$

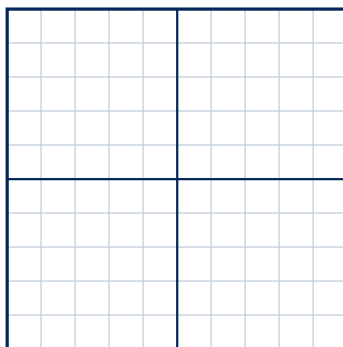
5

3 mk

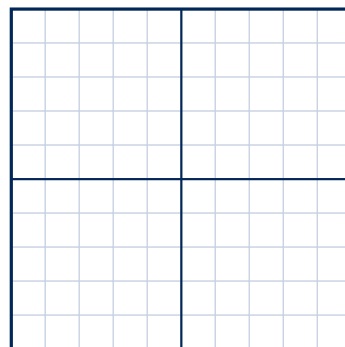
Shade each hundred square to show the amount written underneath it.



30%



0.45



three fifths

How many small squares did you shade each time? ____

B

Converting between the three forms

No calculator in this section — use equivalent fractions and place value.

QUESTIONS 6–12

6

5 mk

Complete the table. Fractions must be in simplest form.

Fraction Decimal Percentage

$$\frac{1}{2}$$

0.25

60%

$$\frac{7}{20}$$

0.36

$$\frac{1}{8}$$

7

4 mk

Write each percentage as a fraction in simplest form.

(a) 65% = ____

(b) 24% = ____

(c) 8% = ____

(d) 150% = ____

(e) 12.5% = ____

8

4 mk

Write each decimal as a percentage.

(a) 0.3 = ____

(b) 0.07 = ____

(c) 0.125 = ____

(d) 1.4 = ____

(e) 0.625 = ____

9

4 mk

Write each percentage as a decimal.

- (a) 45% = _____ (b) 6% = _____ (c) 120% = _____ (d) 2.5% = _____
- (e) 0.5% = _____

10

4 mk

Change each fraction to a percentage by first writing an equivalent fraction with denominator 100.

- (a) $\frac{3}{4} = \frac{\boxed{}}{100} = \text{_____} \%$ (b) $\frac{7}{20} = \frac{\boxed{}}{100} = \text{_____} \%$ (c) $\frac{13}{25} = \frac{\boxed{}}{100} = \text{_____} \%$
- (d) $\frac{9}{50} = \frac{\boxed{}}{100} = \text{_____} \%$

11

4 mk

These denominators do not divide into 100. Use short division to find the decimal first, then the percentage.

- (a) $\frac{3}{8} = \text{_____} = \text{_____} \%$ (b) $\frac{5}{16} = \text{_____} = \text{_____} \%$
- (c) $\frac{1}{3} = \text{_____} = \text{_____} \%$ (round to 1 decimal place) (d) $\frac{2}{3} = \text{_____} = \text{_____} \%$ (round to 1 decimal place)

12

3 mk

True or false? Give a reason for each answer.

- (a) $0.8 = 8\%$ _____
Reason: _____
- (b) $\frac{1}{5} = 20\%$ _____
Reason: _____
- (c) $0.05 = 5\%$ _____
Reason: _____
- (d) $25\% = \frac{1}{4}$ _____
Reason: _____

C**Comparing and ordering**

Convert to one common form before you compare.

QUESTIONS 13–17

13

5 mk

Insert <, > or = between each pair. Show the form you converted to.

- (a) 0.6 65% (b) $\frac{3}{5}$ 0.6 (c) $\frac{7}{8}$ 87% (d) 0.45 $\frac{9}{20}$
- (e) $\frac{2}{3}$ 67%

14

3 mk

Order these from **smallest to largest**. 0.7 $\frac{3}{4}$ 68% $\frac{13}{20}$ 0.72

Form used for comparison: _____

15

4 mk

- (a) Which of 0.45 , 48% , $\frac{13}{25}$ and 0.51 is closest to $\frac{1}{2}$? Show your working.
- (b) Which of 0.9 , 88% and 86% is closest to $\frac{7}{8}$? Show your working.

16

4 mk

Mia's three most recent results were reported in different ways: Mathematics $\frac{17}{20}$, Science 82% , English 0.86 .

- (a) Write all three results as percentages.
- (b) Which was her best result?

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- (c) Her teacher says her Mathematics result is "better than 4 out of 5". Is that correct? Justify your answer.

17

3 mk

The same \$80 jacket is on sale at three shops. Shop A takes 25% off. Shop B takes $\frac{1}{5}$ off. Shop C takes 0.3 of the price off.

- (a) Write each discount as a percentage.
- (b) Which shop is cheapest?

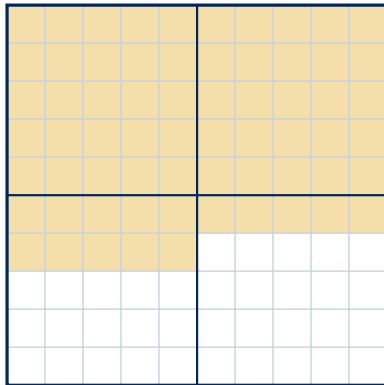
A _____ B _____ C _____

- (c) What do you pay at that shop?

18

4 mk

Use the hundred square to explain why $65\% = 0.65 = \frac{65}{100} = \frac{13}{20}$.



“Per cent means ‘out of ____’, so 65% means ____ of the 100 small squares are shaded, which is the fraction $\frac{\quad}{\quad}$. Because the hundredths column of a decimal counts the same small squares, this is also _____. Grouping the small squares into ____ equal groups of 5 gives $\frac{13}{20}$.”

Now write your own explanation, in the same style, for $40\% = 0.4 = \frac{2}{5}$.

19

4 mk

One hundred per cent of something is one whole, so $100\% = 1$.

- (a) Use this to explain why $175\% = 1.75 = 1\frac{3}{4}$. Refer to the two squares in Question 4. _____

- (b) Write 250% as a decimal and as a mixed number. _____

- (c) Write $2\frac{1}{5}$ as a decimal and as a percentage. _____

20

4 mk

Explain the mistake in each statement, and give the correct answer.

(a) Jayden writes $0.8 = 8\%$.

(b) Priya writes $\frac{1}{5} = 1.5$.

(c) Sam says “150% is impossible, because you cannot have more than all of something”.

21

5 mk

You will need a calculator for this question. Three students convert $\frac{7}{8}$ to a percentage.

Ali: $7 \div 8 = 0.875$, then $\times 100 = 87.5$, so 87.5%

Bea: $8 \div 7 = 1.142857\dots$, so 114.3%

Cam: $7 \div 8 = 0.875$, then moves the decimal point two places to the right, so 87.5%

(a) Whose methods give the correct answer?

(b) Explain what Bea has done wrong.

(c) Use a calculator to write $\frac{9}{16}$ as a percentage.

(d) **Predict first:** is $\frac{5}{8}$ more or less than 60%? Write your prediction, then check it with a calculator and state whether you were right.

22

5 mk

Decide whether each statement is **always**, **sometimes** or **never** true. Justify each answer with an example.

(a) A percentage must be less than or equal to 100%.

(b) Moving the decimal point two places to the right changes a decimal into its percentage.

(c) A fraction with a denominator of 3 can be written as an exact terminating decimal.

E

Challenge

Attempt these after completing Sections A to D. A calculator may be used.

QUESTIONS 23–25

23

3 mk

Complete each chain. Fractions must be in simplest form.

(a) $\frac{13}{20} = \underline{\hspace{1cm}} = \underline{\hspace{1cm}}\%$

(b) $\underline{\hspace{1cm}} = 0.04 = \underline{\hspace{1cm}}\%$

(c) $\underline{\hspace{1cm}} = \underline{\hspace{1cm}} = 275\%$

(d) $\frac{5}{16} = \underline{\hspace{1cm}} = \underline{\hspace{1cm}}\%$

24

5 mk

180 Year 7 students were asked how they travel to school. 35% walk, $\frac{1}{4}$ catch a bus, 0.2 are driven, and the rest ride a bike.

(a) How many students walk?

(b) How many catch a bus?

(c) How many are driven?

(d) What percentage ride a bike, and how many students is that?

A store advertises a jacket: “**Was \$250 — now 40% off.**” The following week the store takes a further 25% off the sale price.

(a) What is the price after the first discount?

(b) What is the price after the second discount?

(c) A customer says “that is 65% off altogether”. Is the customer correct? Explain.

(d) What single percentage discount off \$250 would give the same final price?

WA7MNAUN2 — Explore and explain relationships between fractions, decimals and percentages. Elaborations: drawing diagrams to explain $65\% = 0.65 = 65/100 = 13/20$; explaining that $100\% = 1$, so $175\% = 1.75 = 1\frac{3}{4}$, using diagrams; investigating, comparing and validating calculator strategies for moving between percentages, fractions and decimals.

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