

Chapter 18. Fractions/Decimals/Percentages 1

A Quick Reminder:

1. Write the (i) fraction, (ii) decimal and (iii) percentage of the 100-square that is coloured:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

- (a) Yellow: (i) $\frac{1}{100}$, (ii) 0.01, (iii) 1%.
 (b) Red: (i) _____, (ii) _____, (iii) _____.
 (c) Blue: (i) _____, (ii) _____, (iii) _____.
 (d) Green: (i) _____, (ii) _____, (iii) _____.
 (e) Purple: (i) _____, (ii) _____, (iii) _____.
 (f) Grey: (i) _____, (ii) _____, (iii) _____.
 (g) What percentage of the 100-square is
 (i) coloured? _____ (ii) not coloured? _____

Changing fractions and decimals to percentages.

A Change a **fraction** to a percentage.
Multiply by 100.

$$\frac{1}{4} \times \frac{100}{1} = \frac{100}{4} = 25\%$$

$$\frac{2}{5} \times \frac{100}{1} = \frac{200}{5} = 40\%$$

B Change a **decimal** to a percentage.
Multiply by 100.

$$0.25 \times 100 = 25\%$$

$$0.4 \times 100 = 40\%$$

Move the digits two places to the left!



2. Now write each of the following as **percentages**.

- (a) $\frac{1}{2} =$ _____ (b) 0.09 = _____ (c) 0.5 = _____ (d) $\frac{4}{5} =$ _____ (e) 0.55 = _____
 (f) $\frac{3}{20} =$ _____ (g) 0.63 = _____ (h) $\frac{79}{100} =$ _____ (i) $\frac{9}{10} =$ _____ (j) 0.98 = _____

Changing fractions to percentages. Simplify first!

A $\frac{7}{20} \times \frac{100^5}{1} \rightarrow \frac{35}{1} = 35\%$

B $\frac{19}{25} \times \frac{100^4}{1} \rightarrow \frac{76}{1} = 76\%$

C $\frac{23}{50} \times \frac{100^2}{1} \rightarrow \frac{46}{100} = 46\%$

3. Try simplifying first to change the **fractions** to **percentages**.

- (a) $\frac{7}{50}$ (b) $\frac{11}{25}$ (c) $\frac{3}{5}$ (d) $\frac{13}{20}$ (e) $\frac{1}{2}$ (f) $\frac{9}{25}$ (g) $\frac{8}{20}$ (h) $\frac{13}{25}$ (i) $\frac{19}{20}$

Some fractions don't divide evenly and we have more than 2 decimal places.

$$\frac{7}{3} \times \frac{100^{20}}{1} = \frac{140}{3}$$

$$3 \overline{)140} = 46 \text{ R } 2 = 46\frac{2}{3}\%$$

or

$$46.6666 \text{ etc.}$$

$$3 \overline{)140.0000}$$

$$0.466666 \times 100 = 46.66\% \text{ (stop after 2 decimal places)}$$

4. Change these **fractions** to **percentages**. Stop after 2 decimal places.

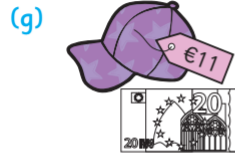
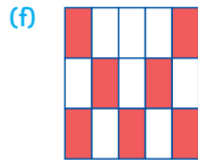
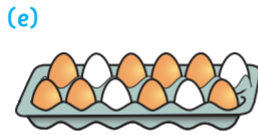
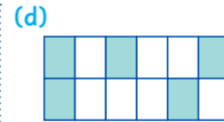
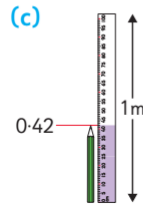
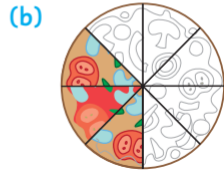
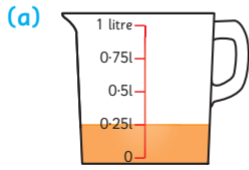
- (a) $\frac{2}{3}$ (b) $\frac{3}{7}$ (c) $\frac{4}{9}$ (d) $\frac{7}{30}$ (e) $\frac{1}{6}$ (f) $\frac{5}{12}$ (g) $\frac{5}{8}$ (h) $\frac{5}{6}$ (i) $\frac{7}{9}$ (j) $\frac{11}{12}$

5. Change these **decimals** to **percentages** (2 decimal places).

- (a) 0.6666 (b) 0.0378 (c) 0.4533 (d) 0.1666 (e) 0.7488 (f) 0.9327

Fractions/Decimals/Percentages 1

1. Write the coloured amounts as a **percentage** of the **full amounts** (2 decimal places).



Changing percentages to fractions or decimals.

A Change a **percentage** to a **fraction**.
Divide by 100.

(i) $60\% \rightarrow \frac{60}{100} \rightarrow \frac{6}{10} = \frac{3}{5}$

(ii) $15\% \rightarrow \frac{15}{100} = \frac{3}{20}$

B Change a **percentage** to a **decimal**.
Divide by 100.

(i) $60\% \div 100 = 0.60$

(ii) $15\% \div 100 = 0.15$

When dividing by 100, move the digits two places to the right!



2. Now change each of these **percentages** to **fractions** and **decimals**.

(a) $12\% = \frac{\quad}{\quad} = 0.\quad$

(b) $70\% = \frac{\quad}{\quad} = 0.\quad$

(c) $45\% = \frac{\quad}{\quad} = 0.\quad$

(d) $4\% = \frac{\quad}{\quad} = 0.\quad$

(e) $50\% = \frac{\quad}{\quad} = 0.\quad$

(f) $5\% = \frac{\quad}{\quad} = 0.\quad$

Changing more difficult **percentages** to **fractions** or **decimals**.

A (i) $33\frac{1}{3}\% \rightarrow \frac{33\frac{1}{3}}{100} \times \frac{3}{3} \rightarrow \frac{100}{300} \rightarrow \frac{100}{300} = \frac{1}{3}$

(ii) $12\frac{1}{2}\% \rightarrow \frac{12\frac{1}{2}}{100} \times \frac{2}{2} \rightarrow \frac{25}{200} \rightarrow \frac{25}{200} = \frac{1}{8}$

B (i) $33.33\% \div 100 = 0.3333$
(or 0.33 to two decimal places)

(ii) $12.5\% \div 100 = 0.125$

4. Now change each of these **percentages** to **fractions** and **decimals**.

(a) $37\frac{1}{2}\% = \frac{\quad}{\quad} = 0.\quad$

(b) $11\frac{1}{4}\% = \frac{\quad}{\quad} = 0.\quad$

(c) $66\frac{2}{3}\% = \frac{\quad}{\quad} = 0.\quad$

(d) $41\frac{2}{3}\% = \frac{\quad}{\quad} = 0.\quad$

(e) $83\frac{1}{3}\% = \frac{\quad}{\quad} = 0.\quad$

(f) $16\frac{2}{3}\% = \frac{\quad}{\quad} = 0.\quad$

Challenge 1

It is **05:00**. What percentage of a full day has already passed?
(2 decimal places)

Challenge 2

A game lasts for 70 minutes. When 20 minutes have been played,
what percentage has still to be played? (2 decimal places)

Fractions/Decimals/Percentages 1

1. Groups of three.

Find the matching sets of **fractions**, **decimals** and **percentages**. Colour the matching sets.

33.33% , 0.2222 , $\frac{2}{3}$, 0.25 , $\frac{2}{6}$, 22.22%
 $\frac{5}{8}$, $\frac{1}{4}$, 58.333 , 62.5% , $\frac{7}{12}$, $58\frac{1}{3}\%$, 25%
 0.6666 , $\frac{2}{9}$, 0.625 , $66\frac{2}{3}\%$, 0.3333

2. Write the next three terms in each of the following sequences.

- (a) $\frac{3}{10}$, 40%, 0.5, _____, _____, _____.
- (b) $\frac{4}{25}$, 0.24, 32%, _____, _____, _____.
- (c) 15%, 0.3, $\frac{9}{20}$, _____, _____, _____.
- (d) $12\frac{1}{2}\%$, $\frac{1}{4}$, 0.375, _____, _____, _____.
- (e) 0.06, 12%, $\frac{9}{50}$, _____, _____, _____.
- (f) $\frac{2}{9}$, $33\frac{1}{3}\%$, 44.44, _____, _____, _____.

3. What goes up but never comes down? Order from **biggest** to **smallest** to find the answer.

G $\frac{4}{6}$, **O** $\frac{6}{8}$, **Y** 75.5%, **E** $\frac{70}{1000}$, **U** $\frac{5}{7}$, **R** 0.705, **A** 70%.

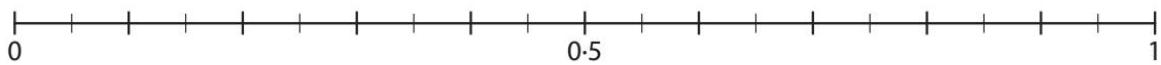
Answer:

4. Complete the table:

Fraction	$\frac{30}{100}$			$\frac{5}{12}$			
Percentage		9.5%			$24\frac{1}{2}\%$		$16\frac{2}{3}\%$
Decimal			0.625			0.723	

5. Write the following fractions, decimals and percentages on the number line.

$\frac{3}{8}$, $\frac{260}{1000}$, 77.7%, $\frac{1}{3}$, 0.050, $\frac{48}{50}$, 0.499, $\frac{9}{25}$, 14%



Challenge

Write the missing amounts on the interlinking dominoes. The order should be percentage, fraction, decimal, percentage, fraction, decimal ...

Domino 1: 25% | $\frac{1}{8}$
 Domino 2: 0.125 | 12%
 Domino 3: | |
 Domino 4: $16\frac{2}{3}\%$ | |
 Domino 5: 0.19 | $37\frac{1}{2}\%$
 Domino 6: | | 0.625
 Domino 7: | |
 Domino 8: 0.28 | $\frac{1}{2}$
 Domino 9: | | 0.48
 Domino 10: | | 25%
 Domino 11: | | $\frac{33}{50}$
 Domino 12: | | 0.39
 Domino 13: | |

Fractions/Decimals/Percentages 1

Weather percentages.

A It was sunny for 27 days of June. What percentage was that?

$$\frac{27}{30} \times \frac{100}{1} \rightarrow \frac{270}{3} \rightarrow \frac{90}{1} = 90\%$$

B It rained for 18 days in April. What percentage was that?

$$\frac{18}{30} \times \frac{100}{1} \rightarrow \frac{180}{3} \rightarrow \frac{60}{1} = 60\%$$

1. Write each of the following as a percentage.

- (a) It snowed for 7 of the 28 days in February. (b) It rained for 21 days in September.
 (c) November had 9 days of sunshine. (d) June had rain on 24 days.

Expressing numbers as a percentage of each other. First write in fraction form.

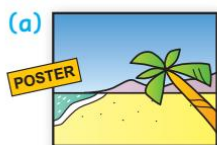
C Aaron spent €7 of his €20 going to the cinema. That means he spent $\frac{7}{20}$ of his money.

$$\frac{7}{20} \times \frac{100^5}{1} = \frac{35}{1} = 35\%$$

D Sally spent €9 of her €25 buying a dress. That means she spent $\frac{9}{25}$ of her money.

$$\frac{9}{25} \times \frac{100^4}{1} = \frac{36}{1} = 36\%$$

2. Work out what percentage of his €20 Aaron spent on each of the following:



€4



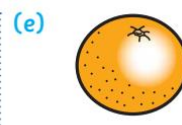
€3.00



€2.60



€1.40



€0.20

(f) What percentage of his money had Aaron left after buying one of each item? _____

3. Expressing numbers as decimals of each other. Use your calculator to 2 decimal places.



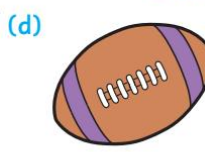
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Goals scored: 6
Success rate 0.16



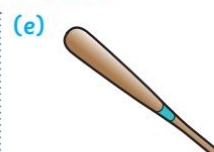
Frees: 73
Points: 65
Success rate _____



Free shots: 25
Scored: 19
Success rate _____



Penalties: 7
Scored: 5
Success rate _____



Pitches: 127
Strikes: 74
Success rate _____

4. Sonia had €85. She spent 60% of it buying a dress. How much money had she left? € _____

5. 87.5% of Toni's money is €54.60. How much money has she altogether? € _____

Challenge

Alex spent €9, Ava spent €11 and Amy spent €17. Calculate the amount each spent as a decimal fraction of the total amount spent (to 2 decimal places).

Alex _____, Ava _____, Amy _____