

Name _____

Date _____

10.1 Fractions, decimals and percentages — worked answers

Convert between fractions, decimals and percentages, and use the conversions to compare quantities. · 72 questions

A · Fluency — Convert between the three forms.

- 1 Write $\frac{1}{2}$ as a percentage. Give the number only.
Answer: 50
 $\frac{1}{2} = 0.5$, and $0.5 \times 100 = 50\%$.
- 2 Write $\frac{1}{4}$ as a percentage. Give the number only.
Answer: 25
 $\frac{1}{4} = 0.25$, and $0.25 \times 100 = 25\%$.
- 3 Write $\frac{3}{4}$ as a percentage. Give the number only.
Answer: 75
 $\frac{3}{4} = 0.75$, and $0.75 \times 100 = 75\%$.
- 4 Write $\frac{1}{5}$ as a percentage. Give the number only.
Answer: 20
 $\frac{1}{5} = 0.2$, and $0.2 \times 100 = 20\%$.
- 5 Write $\frac{2}{5}$ as a percentage. Give the number only.
Answer: 40
 $\frac{2}{5} = 0.4$, and $0.4 \times 100 = 40\%$.
- 6 Write $\frac{3}{5}$ as a percentage. Give the number only.
Answer: 60
 $\frac{3}{5} = 0.6$, and $0.6 \times 100 = 60\%$.
- 7 Write $\frac{4}{5}$ as a percentage. Give the number only.
Answer: 80
 $\frac{4}{5} = 0.8$, and $0.8 \times 100 = 80\%$.
- 8 Write $\frac{1}{10}$ as a percentage. Give the number only.
Answer: 10
 $\frac{1}{10} = 0.1$, and $0.1 \times 100 = 10\%$.
- 9 Write $\frac{3}{10}$ as a percentage. Give the number only.
Answer: 30
 $\frac{3}{10} = 0.3$, and $0.3 \times 100 = 30\%$.

- 10 Write $\frac{7}{10}$ as a percentage. Give the number only.

Answer: 70

$7/10 = 0.7$, and $0.7 \times 100 = 70\%$.

- 11 Write $\frac{9}{10}$ as a percentage. Give the number only.

Answer: 90

$9/10 = 0.9$, and $0.9 \times 100 = 90\%$.

- 12 Write $\frac{1}{100}$ as a percentage. Give the number only.

Answer: 1

$1/100 = 0.01$, and $0.01 \times 100 = 1\%$.

- 13 Write $\frac{1}{20}$ as a percentage. Give the number only.

Answer: 5

$1/20 = 0.05$, and $0.05 \times 100 = 5\%$.

- 14 Write $\frac{3}{20}$ as a percentage. Give the number only.

Answer: 15

$3/20 = 0.15$, and $0.15 \times 100 = 15\%$.

- 15 Write $\frac{1}{25}$ as a percentage. Give the number only.

Answer: 4

$1/25 = 0.04$, and $0.04 \times 100 = 4\%$.

- 16 Write 50% as a decimal.

Answer: 0.5

Divide by 100: $50 \div 100 = 0.5$.

- 17 Write 25% as a decimal.

Answer: 0.25

Divide by 100: $25 \div 100 = 0.25$.

- 18 Write 75% as a decimal.

Answer: 0.75

Divide by 100: $75 \div 100 = 0.75$.

- 19 Write 20% as a decimal.

Answer: 0.2

Divide by 100: $20 \div 100 = 0.2$.

- 20 Write 40% as a decimal.

Answer: 0.4

Divide by 100: $40 \div 100 = 0.4$.

- 21 Write 60% as a decimal.

Answer: 0.6

Divide by 100: $60 \div 100 = 0.6$.

- 22 Write 80% as a decimal.

Answer: 0.8

Divide by 100: $80 \div 100 = 0.8$.

- 23** Write **10%** as a decimal.

Answer: 0.1

Divide by 100: $10 \div 100 = 0.1$.

- 24** Write **30%** as a decimal.

Answer: 0.3

Divide by 100: $30 \div 100 = 0.3$.

- 25** Write **70%** as a decimal.

Answer: 0.7

Divide by 100: $70 \div 100 = 0.7$.

- 26** Write **90%** as a decimal.

Answer: 0.9

Divide by 100: $90 \div 100 = 0.9$.

- 27** Write **1%** as a decimal.

Answer: 0.01

Divide by 100: $1 \div 100 = 0.01$.

- 28** Write **5%** as a decimal.

Answer: 0.05

Divide by 100: $5 \div 100 = 0.05$.

- 29** Write **15%** as a decimal.

Answer: 0.15

Divide by 100: $15 \div 100 = 0.15$.

- 30** Write **4%** as a decimal.

Answer: 0.04

Divide by 100: $4 \div 100 = 0.04$.

- 31** Write **50%** as a fraction in its simplest form.

Answer: $\frac{1}{2}$

50% means 50 out of 100, and $\frac{50}{100}$ simplifies to $\frac{1}{2}$.

- 32** Write **25%** as a fraction in its simplest form.

Answer: $\frac{1}{4}$

25% means 25 out of 100, and $\frac{25}{100}$ simplifies to $\frac{1}{4}$.

- 33** Write **75%** as a fraction in its simplest form.

Answer: $\frac{3}{4}$

75% means 75 out of 100, and $\frac{75}{100}$ simplifies to $\frac{3}{4}$.

- 34** Write **20%** as a fraction in its simplest form.

Answer: $\frac{1}{5}$

20% means 20 out of 100, and $\frac{20}{100}$ simplifies to $\frac{1}{5}$.

- 35** Write **40%** as a fraction in its simplest form.

Answer: $\frac{2}{5}$

40% means 40 out of 100, and $\frac{40}{100}$ simplifies to $\frac{2}{5}$.

- 36** Write **60%** as a fraction in its simplest form.

Answer: 3/5

60% means 60 out of 100, and 60/100 simplifies to 3/5.

- 37** Write **80%** as a fraction in its simplest form.

Answer: 4/5

80% means 80 out of 100, and 80/100 simplifies to 4/5.

- 38** Write **10%** as a fraction in its simplest form.

Answer: 1/10

10% means 10 out of 100, and 10/100 simplifies to 1/10.

- 39** Write **30%** as a fraction in its simplest form.

Answer: 3/10

30% means 30 out of 100, and 30/100 simplifies to 3/10.

- 40** Write **70%** as a fraction in its simplest form.

Answer: 7/10

70% means 70 out of 100, and 70/100 simplifies to 7/10.

- 41** Write **0.35** as a percentage. Give the number only.

Answer: 35

$0.35 \times 100 = 35\%$.

- 42** Write **0.08** as a percentage. Give the number only.

Answer: 8

$0.08 \times 100 = 8\%$.

- 43** Write **0.125** as a percentage. Give the number only.

Answer: 12.5

$0.125 \times 100 = 12.5\%$.

- 44** Write **0.6** as a percentage. Give the number only.

Answer: 60

$0.6 \times 100 = 60\%$.

- 45** Write **0.045** as a percentage. Give the number only.

Answer: 4.5

$0.045 \times 100 = 4.5\%$.

- 46** Write **1.2** as a percentage. Give the number only.

Answer: 120

$1.2 \times 100 = 120\%$.

- 47** Write **0.375** as a percentage. Give the number only.

Answer: 37.5

$0.375 \times 100 = 37.5\%$.

- 48** Write **0.02** as a percentage. Give the number only.

Answer: 2

$0.02 \times 100 = 2\%$.

B · Reasoning — What per cent really means.

49 What does **per cent** mean?

- ☐ Per hundred
- ☐ Per ten
- ☐ Per thousand
- ☐ Per part

Answer: Per hundred

“Cent” is a hundred, as in century. 45% means 45 out of every 100.

50 How do you turn a decimal into a percentage?

- ☐ Divide by 100
- ☐ Multiply by 100
- ☐ Add 100
- ☐ Subtract 100

Answer: Multiply by 100

$0.35 \times 100 = 35\%$.

51 How do you turn a percentage into a decimal?

- ☐ Multiply by 100
- ☐ Divide by 100
- ☐ Add a point
- ☐ Subtract 100

Answer: Divide by 100

$35\% \div 100 = 0.35$.

52 Why is 50% the same as $\frac{1}{2}$?

- ☐ They look alike
- ☐ 50 out of 100 simplifies to 1 out of 2
- ☐ $50 \div 2 = 25$
- ☐ They are not the same

Answer: 50 out of 100 simplifies to 1 out of 2

$50/100 = \frac{1}{2}$ after dividing both by 50.

53 Can a percentage be more than 100?

- ☐ No, never
- ☐ Yes — it means more than the whole
- ☐ Only for money
- ☐ Only in decimals

Answer: Yes — it means more than the whole

150% of 20 is 30. Prices, populations and scores all go above 100%.

54 Is 0.7 the same as 7%?

- ☐ Yes
- ☐ No

Answer: No

$0.7 = 70\%$. It is 7% that equals 0.07 — the commonest slip in this section.

55 Is $\frac{1}{8}$ equal to 12.5%?

- ☐ Yes
- ☐ No

Answer: Yes

$1 \div 8 = 0.125$, and $0.125 \times 100 = 12.5\%$.

56 Which is largest: 0.6, 55% or $\frac{3}{5}$?

- ☐ 0.6
- ☐ 55%
- ☐ $\frac{3}{5}$
- ☐ 0.6 and $\frac{3}{5}$ are equal and largest

Answer: 0.6 and $\frac{3}{5}$ are equal and largest

$\frac{3}{5} = 0.6 = 60\%$, which beats 55%. Convert everything to one form before comparing.

57 What is the quickest way to compare a fraction, a decimal and a percentage?

- ☐ Guess
- ☐ Convert them all to the same form
- ☐ Compare the top numbers
- ☐ Add them

Answer: Convert them all to the same form

Percentages are usually easiest, because the denominator is always 100.

C · Challenge — Awkward denominators and ordering.

58 Write $\frac{3}{8}$ as a percentage. Give the number only.

Answer: 37.5

$3 \div 8 = 0.375$, and $0.375 \times 100 = 37.5\%$.

59 Write $\frac{5}{8}$ as a percentage. Give the number only.

Answer: 62.5

$5 \div 8 = 0.625 = 62.5\%$.

60 Write $\frac{7}{20}$ as a percentage. Give the number only.

Answer: 35

$\frac{7}{20} = \frac{35}{100} = 35\%$.

61 Write 45% as a fraction in its simplest form.

Answer: $\frac{9}{20}$

$\frac{45}{100}$ divides by 5 to give $\frac{9}{20}$.

62 Write 12.5% as a fraction in its simplest form.

Answer: $\frac{1}{8}$

$12.5\% = \frac{125}{1000} = \frac{1}{8}$.

63 Put these in order, smallest first, and give the largest: 0.45, 42%, $\frac{9}{20}$. Give the answer as a percentage number.

Answer: 45

$0.45 = 45\%$, $\frac{9}{20} = 45\%$, and 42% is smaller. The largest value is 45%.

64 What percentage is $\frac{1}{3}$, to 1 decimal place?

Answer: 33.3

$1 \div 3 = 0.3333\dots$, so 33.3% to 1 d.p.

D · Word problems — Scores, charges and offers.

65 A test is marked out of 100 and a learner scores 68. What percentage is that?

Answer: 68

Out of 100, the score is the percentage.

- 66** A learner gets 17 out of 20. What percentage is that?

Answer: 85

$$17/20 = 85/100 = 85\%.$$

- 67** A shirt is 40% cotton. What fraction is that, in its simplest form? Give the denominator.

Answer: 5

$$40/100 = 2/5.$$

- 68** $3/4$ of a class walk to school. What percentage is that?

Answer: 75

$$3/4 = 0.75 = 75\%.$$

- 69** A battery shows 0.35 charge. What percentage is that?

Answer: 35

$$0.35 \times 100 = 35\%.$$

- 70** A survey finds $9/25$ prefer tea. What percentage is that?

Answer: 36

$$9/25 = 36/100 = 36\%.$$

- 71** A phone is 80% charged. What decimal is that?

Answer: 0.8

$$80 \div 100 = 0.8.$$

- 72** A shop says “up to $1/5$ off”. What percentage is that?

Answer: 20

$$1/5 = 20\%.$$