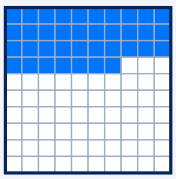
PERCENTAGE PROBLEMS (CALCULATOR)

BUILDING BLOCKS

NAME _____ CLASS _____ DATE _____

KEY IDEA



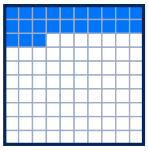
37% means 37 out of 100.

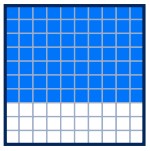
$37\% = \frac{37}{100} = 0.37$

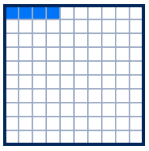
37% of £84: $0.37 \times 84 =$ **31.08**

So 37% of £84 = £31.08

1 Write the percentage shaded. Then write it as a decimal.

 ____ % = ____

 ____ % = ____

 ____ % = ____

2 Draw a line to match each percentage to its decimal.

4%	1.4
40%	0.04
0.4%	0.004
140%	0.4

3 Use a calculator. Multiply by the decimal to find each percentage.

a) 23% of £68: 68 → × 0.23 → ____

b) 45% of 160: 160 → × 0.45 → ____

c) 8% of £45: 45 → ____ → ____

Write the multiplier in the empty pill.

4 Each calculator shows an amount of money in pounds. Write it to the nearest penny.

15.6 £____ 23.456 £____ 7.0833333 £____

PERCENTAGE PROBLEMS (CALCULATOR)

SUPPORT

NAME _____ CLASS _____ DATE _____

KEY IDEA

On a calculator, use ONE calculation with a multiplier. For 12%:

12% of an amount	**× 0.12**	Increase by 12%	**× 1.12**
Decrease by 12%	**× 0.88**	Original before a 12% increase	**÷ 1.12**

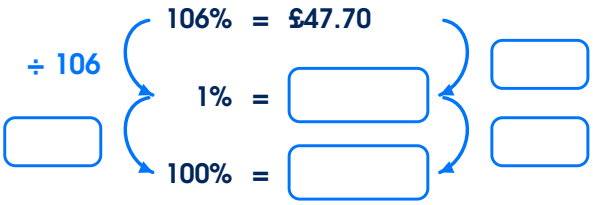
1 Fill in the multiplier. Then use a calculator.

a) 17% of £64 £64 × ☐ = £☐

b) Increase £64 by 17% £64 × ☐ = £☐

c) Decrease £64 by 17% £64 × ☐ = £☐

2 After a 6% increase, a monthly bus pass costs £47.70. Find the cost before the increase.



Or use the multiplier:

£47.70 ÷ 1.06 = £☐

3 Use a calculator to find each percentage change.

a) A house: bought for £185 000, sold for £203 500

Change = £☐ Percentage change = ☐ %

b) A car: bought for £14 500, sold for £11 020

Change = £☐ Percentage change = ☐ %

4 VAT (value added tax) is 20%. It is added on to a price.

a) A TV costs £449 before VAT. Find the price with VAT. ☐

b) A coat costs £96 with VAT. Find the price before VAT. ☐

PERCENTAGE PROBLEMS (CALCULATOR)

CORE

NAME _____ CLASS _____ DATE _____

KEY IDEA

Use one calculation. New amount = original × multiplier. Original = new amount ÷ multiplier. Percentage change = change ÷ original × 100. Round money to 2 d.p.

FLUENCY

1 Use a calculator. Give money to the nearest penny and percentages to 1 d.p.

a) Increase £1450 by 3.5%.

b) 37.5 kg is 15% of a mass. Find the mass.

c) Find the percentage change from 2340 to 1989.

d) After a 7% decrease, a price is £232.50. Find the original.

2 Complete the table.

ITEM	PRICE BEFORE VAT	PRICE WITH 20% VAT
Phone	**£245**	
Laptop		**£714**
Kettle	**£37.50**	

REASONING

3 A price rises by 8% to £37.80. Two students find the original price.

Max: 37.80 ÷ 108 × 100 **Whitney: 37.80 ÷ 1.08**

a) Show that both methods give the same original price.

b) Why does Whitney divide by 1.08? Whose method is more efficient?

.....

4 Ola increases a price of £260 by 17.5%.

Ola says, "260 × 1.75 = 455, so the new price is £455."

a) Explain Ola's mistake.

.....

b) Work out the correct new price.

PERCENTAGE PROBLEMS (CALCULATOR)

GREATER DEPTH

NAME _____ CLASS _____ DATE _____

REASONING

1 Is each statement always, sometimes or never true? Circle your answer.

If it is sometimes true, give an example of when it is true and when it is not.

a) ÷ 1.2 gives the same answer as × 0.8. ALWAYS SOMETIMES NEVER

b) × 0.85 then ÷ 0.85 gets you back to the start. ALWAYS SOMETIMES NEVER

c) After a 35% decrease, ÷ 0.35 finds the original. ALWAYS SOMETIMES NEVER

d) A calculator answer to a % question needs rounding. ALWAYS SOMETIMES NEVER

PROBLEM SOLVING

2 A club has 128 members. The ratio of boys to girls is 7 : 9. 25% of the boys and 37.5% of the girls play an instrument. What percentage of the club play an instrument? Give your answer to 1 d.p.

Percentage of the club = ☐ %

3 Two shops sell a phone that costs £340 before any changes.

Shop A takes 15% off, then adds 20% VAT. Shop B adds 20% VAT, then takes 15% off.

Shop A: £☐ Shop B: £☐

Explain what you notice.

★ CHALLENGE FOR ALL

4 A town's population rose by 12% from 2023 to 2024, to 31 920. From 2024 to 2025 it fell by 5%.

a) Population in 2023 = ☐

b) Overall percentage change from 2023 to 2025 = ☐ %

PERCENTAGE PROBLEMS (CALCULATOR)

ANSWERS

BUILDING BLOCKS

1 23% = 0.23 · 70% = 0.7 · 4% = 0.04
2 4% → 0.04 · 40% → 0.4 · 0.4% → 0.004 · 140% → 1.4
3 a) £15.64 b) 72 c) × 0.08: £3.60
4 £15.60 · £23.46 · £7.08

SUPPORT

1 a) × 0.17 = £10.88 b) × 1.17 = £74.88 c) × 0.83 = £53.12
2 ÷ 106 on both sides: 1% = £0.45 · × 100: 100% = £45 · £47.70 ÷ 1.06 = £45
3 a) £18 500, 10% increase b) £3480, 24% decrease
4 a) £449 × 1.2 = £538.80 b) £96 ÷ 1.2 = £80

CORE

1 a) £1500.75 b) 250 kg c) 15% decrease d) £250
2 Phone £294 · Laptop £595 · Kettle £45
3 a) Both give £35 b) £37.80 is 108% of the original and 108% = 1.08, so dividing by 1.08 goes back to 100% in one step: Whitney's method is more efficient.
4 a) A 17.5% increase is × 1.175, not × 1.75 (that is a 75% increase) b) £305.50

GREATER DEPTH

1 a) Never (÷ 1.2 = × 0.833...) b) Always c) Never (divide by 0.65) d) Sometimes, e.g. 17 out of 40 = 42.5% exactly; 17 out of 30 = 56.666...%
2 Boys 56, girls 72. 14 + 27 = 41 play. 41 ÷ 128 × 100 = 32.0%
3 Shop A: 340 × 0.85 × 1.2 = £346.80. Shop B: 340 × 1.2 × 0.85 = £346.80. They are the same because multiplication can be done in any order.
4 a) 31 920 ÷ 1.12 = 28 500 b) 2025: 31 920 × 0.95 = 30 324; change = 1824 ÷ 28 500 × 100 = 6.4% increase