



eClassroom

GCSE Mathematics

Percentages

Questions

Pearson Edexcel GCSE & iGCSE Mathematics



Section A — Foundation

Worked Examples

[Fluency]

Find 35% of 240.

Multiplier method: $35\% = 0.35$

$$0.35 \times 240 = 84$$

[Reasoning]

A jacket costs £60 before a 20% discount. Ellie says the sale price is £48. Is she correct?

Multiplier for 20% decrease: $1 - 0.20 = 0.80$

$$60 \times 0.80 = £48 \rightarrow \text{Yes, Ellie is correct.}$$

[Problem Solving]

A car was bought for £8000 and sold for £6200. Find the percentage loss.

$$\text{Loss} = 8000 - 6200 = £1800$$

$$\% \text{ loss} = (1800 \div 8000) \times 100 = 22.5\%$$

[Fluency]

1. Work out 30% of 150.

(1 mark)

[Fluency]

2. Increase £80 by 25%.

(2 marks)

[Fluency]

3. Decrease 200 by 15%.

(2 marks)

[Fluency]

4. Express 36 out of 60 as a percentage.

(2 marks)

[Fluency]

5. After a 20% increase, the price of a coat is £90.
Find the original price of the coat.

(2 marks)

**[Reasoning]**

6. A television costs £48 before VAT. VAT is charged at 20%. Calculate the total cost of the television including VAT.

(2 marks)

[Reasoning]

7. A shop has a sale with 30% off all items. The original price of a jacket is £85. Work out the sale price of the jacket.

(2 marks)

[Reasoning]

8. A student scores 42 marks out of a possible 56 marks in a test. Work out the student's percentage score.

(2 marks)

[Problem Solving]

9. Shop A sells a pair of trainers for £120 after a 20% reduction. Shop B sells the same trainers for £123.53 after a 15% reduction.

Which shop had the higher original price? Show all your working.

(4 marks)

[Problem Solving]

10. The number of visitors to a museum increased from 240 to 300. Work out the percentage increase in the number of visitors.

(2 marks)



Section B — Higher

Worked Examples

[Fluency]

A house is bought for £180 000. Its value increases by 6% each year. Find its value after 3 years.

Multiplier for 6% increase per year: 1.06

$$\text{Value} = 180\,000 \times 1.06^3 = 180\,000 \times 1.191016 = \mathbf{\pounds 214\,382.88}$$

[Reasoning]

A price is increased by 30% and then decreased by 30%. Explain why the final price is not the same as the original.

$$\text{Multiplier: } 1.30 \times 0.70 = 0.91$$

The final price is 91% of the original — a net decrease of 9%.

The percentage changes act on different amounts, so they do **not** cancel.

[Problem Solving]

After 2 years of compound interest, £5000 grows to £5618.00. Find the annual interest rate r .

$$5000 \times (1 + r)^2 = 5618$$

$$(1 + r)^2 = 5618 \div 5000 = 1.1236$$

$$1 + r = \sqrt{1.1236} = 1.06 \rightarrow r = 0.06 = \mathbf{6\%}$$

[Fluency]

1. £2000 is invested at 3% compound interest per annum.

Calculate the value of the investment after 4 years.

Give your answer to the nearest penny.

(3 marks)

[Fluency]

2. A car is bought for £12 000. It depreciates in value by 18% each year.

Calculate the value of the car after 3 years.

Give your answer to the nearest penny.

(3 marks)

[Fluency]

3. After a 35% increase, the price of a sofa is £162.

Work out the original price of the sofa.

(2 marks)

**[Reasoning]**

4. A town has a population of 25 000. The population grows at a rate of 4% per year. After how many complete years will the population first exceed 30 000?
Show your working.

(3 marks)

[Reasoning]

5. A shopkeeper applies a 10% discount to an item and then a further 15% discount.
(a) Show that the combined effect is equivalent to a single reduction of 23.5%. (2)
(b) Explain why applying a 25% discount at once would give a different result. (1)

(3 marks)

[Reasoning]

6. A price is increased by $x\%$ and then decreased by $x\%$.
(a) Show that the net effect is always a decrease. (2)
(b) Find the overall percentage decrease when $x = 20$. (1)

(3 marks)

[Problem Solving]

7. £5000 is to be invested for 5 years.
Option A: 2.5% simple interest per annum.
Option B: 2% compound interest per annum.

Which option gives a greater return? Show full working.

(4 marks)

[Problem Solving]

8. £2000 is invested at $r\%$ compound interest per annum.
After 2 years the investment is worth £2205.
Find the value of r .

(3 marks)

[Problem Solving]

9. A car is bought for £18 000. In the first year it depreciates by 12%.
In each subsequent year it depreciates by 8%.

Find the value of the car at the end of 3 years.
Give your answer to the nearest penny.

(4 marks)

**[Problem Solving]**

10. A student measures a length as 4.8 cm. The actual length is 5.0 cm.

- (a) Calculate the percentage error in the student's measurement. (2)
- (b) The student says: "My measurement is 96% accurate." Comment on this statement. (1)

(3 marks)