Your notes

GCSE Maths: revision notes

Percentages

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Start here: what a percentage is

- Per cent means “out of 100”: 35% is 35 out of every 100, which is 35/100, or 0.35.
- To find a **percentage** of an amount, change the **percentage** to a decimal and multiply: 35% of 80 is 0.35 × 80 = 28.
- That decimal is the **multiplier**, and it works for increases and decreases too: increasing by 20% means × 1.2, decreasing by 20% means × 0.8.

Percentages of amounts

- Per cent means 'out of 100'.
- Without a calculator: 10% = divide by 10, 1% = divide by 100, then build up (e.g. 35% = 10% + 10% + 10% + 5%).
- With a calculator, use a **multiplier**: 35% of 80 = 0.35 × 80 = 28.

One number as a percentage of another

- Divide, then multiply by 100.
- 18 out of 24 = 18 ÷ 24 × 100 = 75%.

Percentage increase and decrease

- Increase by 15%: multiply by 1.15. Decrease by 15%: multiply by 0.85.
- **Percentage change** = change ÷ original × 100.

Reverse percentages

- Divide by the **multiplier** to find the original amount.
- After a 20% increase a price is £96, so the original price is £96 ÷ 1.2 = £80.
- Don't take 20% off the new amount: that gives the wrong answer.

Interest and depreciation

- **Simple interest** adds the same amount every year.
- **Compound interest** uses the **multiplier** to a power: £500 at 3% for 4 years = 500×1.03^4.
- **Depreciation** (losing value) uses a **multiplier** less than 1, e.g. 10% a year = × 0.9 each year.

Exam tip

- With a calculator, use **multipliers**: a 12% increase is × 1.12. For repeated changes, use a power.
- **Percentage change** = change ÷ original × 100.

Common mistakes

- Dividing by the new value in a **percentage change**, not the original.
- In a **reverse percentage**, taking the **percentage** off the sale price. Divide by the **multiplier**.
- Adding the same interest each year when it's compound.

Worked examples

Work out 35% of £80 without a calculator

Find 10% by dividing by 10. **£8**

30% is three lots of 10%. **3 × £8 = £24**

5% is half of 10%. **£4**

Add 30% and 5%. **£24 + £4 = £28**

Answer: £28

Increase £250 by 12%

Find the multiplier: 100% + 12% = 112%. **1.12**

Multiply. **250 × 1.12 = 280**

Answer: £280

Your notes

After a 20% discount, a coat costs £48. What was the price before the discount?

A 20% discount leaves 80% of the price, so the multiplier is 0.8. **original × 0.8 = 48**

Work backwards: divide by the multiplier. **48 ÷ 0.8**

Check: 20% of £60 is £12, and £60 – £12 = £48. ✓

Answer: £60

Key terms

Percentage	A number out of 100.
Multiplier	The decimal you multiply by to find or change a percentage, e.g. 1.15 for a 15% increase.
Percentage change	Change ÷ original × 100.
Reverse percentage	Finding the original amount by dividing by the multiplier.
Simple interest	Interest that is the same amount every year.
Compound interest	Interest added to the total each year, so it grows by the same percentage each time.
Depreciation	A decrease in value over time.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. What is 10% of 250?
2. What is 35% of 80?
3. Write 18 out of 24 as a percentage.
4. Which multiplier increases an amount by 15%?
5. Which multiplier decreases an amount by 15%?
6. A £40 jacket is reduced by 25%. What is the new price?
7. A price rises from £50 to £60. What is the percentage increase?
8. After a 20% increase a price is £96. What was the original price?

Answers

1. 25
2. 28
3. 75%
4. 1.15
5. 0.85
6. £30
7. 20%
8. £80

Your notes

What to do next

Practise 12 questions on this topic

Try 6 exam questions, with mark schemes

Read the lesson, one step at a time

Free revision for GCSE and KS3 at lycolearn.co.uk. Some notes are for one exam board only, and say so in brackets.

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