1.6 Percentages

Name: _____ Class: _____ Date: _____ **Total: 21 marks**

KEY WORDS multiplier • compound interest

Percentages

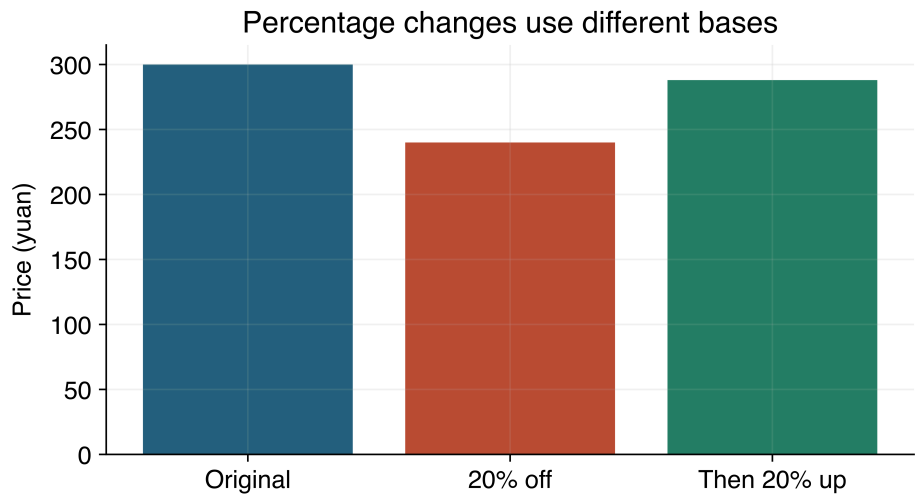
Objective

Use percentages as multipliers: percentage of, increase and decrease, reverse percentage, compound interest and depreciation, and repeated change (objectives Foundation 1.6 A–G and Higher 1.6 A–B).

1 Key knowledge and worked examples

Multipliers. $35\% = 0.35 = \frac{7}{20}$; increase by 12% is $\times 1.12$; decrease by 20% is $\times 0.8$. Reverse percentage DIVIDES by the multiplier: 6225 after a 17% reduction means an original of $6225 \div 0.83 = 7500$ (June 2024 2HR Q8).

Repeated change. $A = P\left(1 \pm \frac{r}{100}\right)^n$: £2000 at 3% compound for 4 years grows to $2000 \times 1.03^4 =$ £2251.02; £12000 depreciating 15% for 3 years falls to $12000 \times 0.85^3 =$ £7369.50.



Original native-lesson illustration; labels belong to its worked example.

2 Practice

2.1 Find 35% of 240 [2]

2.2 Increase 65 by 20% [2]

2.3 Write 0.35 as a fraction in its simplest form [2]

2.4 A jumper priced £28 is reduced by 25%. Find the sale price. [2]

2.5 After a 10% rise a ticket costs £22. Find the original price. [3]

3 Exam-style questions

3.1 *(Edexcel 4MA1 2HR June 2024 Q8, adapted.)* In a sale, all normal prices are reduced by 17%. The sale price of a fridge is 6225 rupees. Work out the normal price. [3]

3.2 *(Original.)* £2000 is invested at 3% compound interest for 4 years. Find the final amount and the total interest earned. [3]

3.3 *(Original.)* A car bought for £12000 depreciates by 15% each year. (a) Find its value after 3 years. (b) Find the percentage of the original value lost. [4]

Solutions

2.1 $0.35 \times 240 = 84$.

2.2 $65 \times 1.2 = 78$.

2.3 $\frac{35}{100} = \frac{7}{20}$.

2.4 $28 \times 0.75 = £21$.

2.5 $22 \div 1.1 = £20$.

3.1 Normal price $= 6225 \div 0.83 = 7500$ rupees.

3.2 $2000 \times 1.03^4 = £2251.02$; interest $= 2251.02 - 2000 = £251.02$.

3.3 (a) $12000 \times 0.85^3 = £7369.50$. (b) Lost: $12000 - 7369.50 = £4630.50$, which is $\frac{4630.50}{12000} = 38.6\%$ (1 d.p.) – note $1 - 0.85^3 = 0.3859$.

Local review guidance: the multiplier stated before the calculation; money to 2 d.p.; reverse-percentage answers found by DIVIDING, not subtracting the percent. This is authored classroom guidance.