

3. Ratio, proportion and rates of change

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Name: _____ Score: _____

1. A price of 80 rises by 15%. Find the new price.

2. A 25% discount leaves a price of 90. Find the original price.

3. Find concentrate in a 700 ml mixture at concentrate:water=2:5.

4. At 1:25000, find the real length in km for 4 cm.

5. Use C=3L to find C for L=6.

6. Every straight line represents direct proportion.

☐ True ☐ False
7. Converting density from g/cm³ to kg/m³ leaves its numerical value unchanged.

☐ True ☐ False
8. Doubling all lengths of a solid doubles its volume.

☐ True ☐ False
9. Simple and compound interest always give the same balance after two years.

☐ True ☐ False
10. Depositing before interest always gives the same result as depositing after interest.

☐ True ☐ False

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1. **92.0**

Multiply by 1.15: 80×1.15=92.
2. **120.0**

The sale price is 75% of the original: 90/0.75=120.
3. **200.0**

700/(2+5)×2=200 ml.
4. **1.0**

4×25000/100000=1 km.
5. **18.0**

Substitute L=6: C=18.
6. **False**

An increasing graph need not be direct proportion. An inverse relationship is proportional to 1/x, not to -x. Keep a product constant for inverse proportion and a quotient constant for direct proportion.
7. **False**

Volume conversions cube the length factor and area conversions square it. A density of 2.7 g/cm³ is not 2.7 kg/m³. A cheaper package may cost more per kilogram; include only comparable products.
8. **False**

Areas do not scale by k, and volumes do not scale by k². Similarity needs every corresponding length to share the same factor. Reversing a ratio requires the reciprocal factor.
9. **False**

Use the original value as the denominator for percentage change. Repeated 20% decreases do not subtract 40% of the initial amount. A rate per year cannot be treated as a rate per month without a specified conversion.
10. **False**

Preserve operation order and use the updated value each time. Do not round early or confuse the initial value with the first updated value. A continuous fractional-period estimate does not answer a whole-period question by itself.