## GCSE Mathematics – Higher Tier

# Spot the Mistake: Ratio, Proportion and Rates of Change

Solutions and mark scheme

Every question is worth 4 marks: (a) B1 for the correct line; (b) B1 for a clear explanation; (c) M1 for a correct method and A1 for the correct answer. Accept equivalent explanations and methods.

| Q | (a) | (b) What went wrong | (c) Correct solution |
|---|---|---|---|
| 1 | Line 1 | The 15% is of the original price, not the sale price. £68 is 85% of the original. | $68 \div 0.85 = £80$ |
| 2 | Line 2 | This is simple interest. Compound interest is added to the new total each year. | $3000 \times 1.025^4 = £3311.44$ |
| 3 | Line 1 | A 12% decrease uses the multiplier $1 - 0.12 = 0.88$. | $18\,000 \times 0.88^3 = £12\,266.50$ |
| 4 | Line 2 | The £120 difference is $5 - 3 = 2$ parts, not 8. | One part = £60; Ali £180, Beth £300 |
| 5 | Line 2 | $x^2 = 5^2 = 25$, not 5. | $50 = 25k$, $k = 2$; $y = 2 \times 4 = 8$ |
| 6 | Line 3 | The formula needs $d^2 = 36$, not $d = 6$. | $F = 180 \div 36 = 5$ |
| 7 | Line 3 | There are 3600 seconds in an hour; dividing by 60 gives metres per minute. | $72\,000 \div 3600 = 20\,\text{m/s}$ |
| 8 | Line 2 | $1\,\text{m}^2 = 100 \times 100 = 10\,000\,\text{cm}^2$, so divide by 10 000. | $0.12\,\text{m}^2$; $240 \div 0.12 = 2000\,\text{N/m}^2$ |
| 9 | Line 2 | Percentage change is divided by the *original* value, £240. | $\frac{36}{240} \times 100 = 15\%$ |
| 10 | Line 2 | Area scale factor 4 means length scale factor $\sqrt{4} = 2$, so the volume scale factor is $2^3 = 8$. | $20 \times 8 = 160\,\text{cm}^3$ |