GCSE Mathematics – Higher Tier

Spot the Mistake: Number

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 4	$15 = 1.5 \times 10$, so the power of 10 should go up by 1, not down.	$15 \times 10^{11} = 1.5 \times 10^{12}$
2	Line 3	A negative power means the reciprocal, not a negative number.	$27^{-\frac{2}{3}} = \frac{1}{27^{\frac{2}{3}}} = \frac{1}{9}$
3	Line 3	$\sqrt{5} \times \sqrt{5} = 5$, not 25.	$9 + 6\sqrt{5} + 5 = 14 + 6\sqrt{5}$
4	Line 3	$\sqrt{5} \times \sqrt{5} = 5$, not 25.	$\frac{10\sqrt{5}}{5} = 2\sqrt{5}$
5	Line 2	Two digits recur, so multiply by 100, not 10.	$100x = 45.4545\ldots$, $99x = 45$, $x = \frac{45}{99} = \frac{5}{11}$
6	Line 3	Truncation never rounds up, so y is at least 7.4 and less than 7.5. Halving 0.1 is only used for rounding.	$7.4 \leqslant y < 7.5$
7	Line 3	To make a quotient as large as possible, divide by the *lower* bound of b.	$8.45 \div 2.05 = 4.12$ (3 s.f.)
8	Line 4	The LCM uses the highest power of every prime factor.	HCF = 6; LCM = $2^2 \times 3^2 \times 5 \times 7 = 1260$
9	Line 2	Once the first digit is used, 0 becomes available, so there are still 9 choices.	$9 \times 9 \times 8 \times 7 = 4536$ codes
10	Line 3	Dividing by 0.2 is the same as multiplying by 5, so the answer gets bigger.	$280 \div 0.2 = 1400$