FOUNDATION & HIGHER

SAME AT BOTH TIERS

Name ..... Class .....

N15: Rounding and error intervals

Reason about rounding, truncation and error intervals

20 marks · 25 minutes · Non-calculator

1) Kai rounds 3.849 to 1 decimal place by first rounding to 3.85 and then to 3.9. Explain his mistake and give the correct answer.

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[Question 1: 2 marks]

2) A length is 6.4 cm to 1 decimal place. Ben writes the error interval as $6.35 \leqslant l \leqslant 6.45$. Explain his mistake.

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[Question 2: 2 marks]

3) A number truncated to 1 decimal place is 2.7. The same number rounded to 1 decimal place is 2.8. Find the error interval for the number. Explain your answer.

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[Question 3: 2 marks]

4) Show that 2.65 rounds to 2.7 but truncates to 2.6, both to 1 decimal place.

[Question 4: 2 marks]

5) The population of a town is 34 000 to 2 significant figures. Find the smallest and largest possible populations. Explain.

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[Question 5: 2 marks]

6) Can a number round to 5 (to the nearest whole number) but truncate to 4? Explain with an example.

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[Question 6: 2 marks]

7) A mass is 70 kg to the nearest 10 kg. Could the actual mass be 64 kg? Explain.

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[Question 7: 2 marks]

8) Round 1.996 to 2 decimal places. Explain why the zeros must be written.

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[Question 8: 2 marks]

9) x = 5.2 to 2 significant figures. Write the error interval for x and explain the end points.

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[Question 9: 2 marks]

10) Explain the difference between rounding and truncating.

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[Question 10: 2 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	3.8	Must round 3.849 directly; second decimal 4 so round down (C1); 3.8 (B1).
2	Upper end	The upper bound 6.45 would round to 6.5, so it should be $<$ (C2).
3	$2.75 \leqslant x < 2.8$	Rounding gives $\geqslant 2.75$, truncation gives < 2.8 (M1); combined interval (C1).
4	Shown	Rounding: 5 rounds up (C1); truncating: drop the digit (C1).
5	33 500 and 34 499	Half of 1000 either side (M1); whole numbers, so 34 499 (C1).
6	Yes, e.g. 4.7	Example (B1); explanation (C1).
7	No	Interval $65 \leqslant m < 75$ (M1); 64 is outside (C1).
8	2.00	2.00 (B1); zeros show the accuracy (C1).
9	$5.15 \leqslant x < 5.25$	Interval (B1); explanation of half a unit each way (C1).
10	Explanation	Rounding goes to the nearest value; truncating cuts off digits (C2).