Bounds Error Intervals

GCSE Maths · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

A mass is 5.4 kg to 1 decimal place. Write down its error interval.

Step 1 · Rounding unit 0.1; half is 0.05

$5.4 - 0.05 = 5.35$ and $5.4 + 0.05 = 5.45$

Step 2 · Inequality notation

$5.35 \leq m < 5.45$

Answer: $5.35 \leq m < 5.45$

Check: 5.35 rounds to 5.4 ✓; 5.45 rounds to 5.5, so it is excluded ✓

2. Now try one with the steps

A length is 8 cm to the nearest centimetre. Write down its error interval.

Step 1 · Half a centimetre each side

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. A length is 8 cm to the nearest centimetre. Write down its lower bound, in cm. [1]

2. A value is 3.7 to 1 decimal place. Write its error interval. [2]

3. A number is 120 to the nearest 10. Write its error interval. [2]

4. A mass is 64 kg to the nearest kilogram. Write down its upper bound, in kg. [1]

5. A value is 4.28 to 2 decimal places. Write its error interval. [2]

6. A number is 3000 to 1 significant figure. Write its error interval. [2]

7. A measurement is 0.06 to 1 significant figure. Write its error interval. [2]

8. A number is 45 000 to 2 significant figures. Write its error interval. [2]

9. A time t is truncated to 1 decimal place as 12.4 s. Write the error interval for t. [2]

10. A number n is truncated to a whole number, giving 7. Write the error interval for n. [2]

11. A length is 250 m to the nearest 5 m. Write its error interval. [2]

12. A value rounds to 6.3 (1 d.p.). Which of 6.25, 6.35 and 6.349 could be the true value? [2]

13. The attendance at a match is 23 000 to the nearest thousand. What is the smallest possible number of people? [1]

14. For the match in question 13, what is the largest possible number of people? [1]

15. x rounds to 2.6 (1 d.p.) and truncates to 2.5 (1 d.p.). Write the error interval for x. [3]

4. Before you hand it in

$7.5 \leq x \leq 8.5$

8.5 would round up to 9. Use < at the top: $7.5 \leq x < 8.5$.

3.7 to 1 d.p. → 3.2 ≤ x < 4.2

Half the ROUNDING unit: 1 d.p. means 0.1, so ± 0.05.

6.7 truncated → 6.65 ≤ x < 6.75

Truncation only chops digits, so x is at least 6.7 and less than 6.8.

Largest crowd of 23 000 to the nearest thousand is 23 500

23 500 rounds to 24 000. For whole numbers of people the largest is 23 499.