

Bounds in calculations: which step breaks?

ANSWERS

Name _____

These follow one question through its steps in order: $a = 18.6$ and $b = 11.3$, each to 1 decimal place, and $c = 1.25$ to 2 decimal places. Write $\frac{a+b}{c}$ to a suitable degree of accuracy.

- 1 $c = 1.25$ to 2 decimal places. Find the lower and upper bounds of c .

STEP 1: THE BOUNDS OF EACH VALUE • FIX IT CARD 1

1.245 and 1.255

- 2a a is between 18.55 and 18.65. b is between 11.25 and 11.35. Which bounds give the upper bound of $a + b$?

STEP 2A: WHICH BOUNDS? + AND $\times$ • FIX IT CARD 2

18.65 + 11.35 (both upper)

- 2b The upper bound of $a + b$ is 30. c is between 1.245 and 1.255. Which bound of c gives the upper bound of $\frac{a+b}{c}$?

STEP 2B: WHICH BOUNDS? - AND $\div$ • FIX IT CARD 2

1.245, the lower bound

- 3 The bounds of $\frac{a+b}{c}$ are $\frac{18.55 + 11.25}{1.255}$ and $\frac{18.65 + 11.35}{1.245}$. Work out each to 4 decimal places.

STEP 3: WORK IT OUT • FIX IT CARD 3

23.7450 and 24.0964

- 4 The bounds of $\frac{a+b}{c}$ are 23.7450 and 24.0964. Round both to 2 sf, then both to 3 sf.

STEP 4: ROUND BOTH BOUNDS • FIX IT CARD 4

24 and 24, then 23.7 and 24.1

- 5 To 2 sf both bounds are 24. To 3 sf they are 23.7 and 24.1. Write $\frac{a+b}{c}$ to a suitable degree of accuracy.

STEP 5: WHERE THEY AGREE • FIX IT CARD 5

24 (2 sf)

The first question wrong is the step that breaks. Give that student the card it names.

The Maths Habit