

Error Intervals Mastery

Practice Worksheet (Compact Layout)

I DO

A number, y , is rounded to 2 significant figures.

The result is 0.046.

Write down the error interval for y .

WE DO

A number, x , is rounded to 3 significant figures.

The result is 8.05.

Write down the error interval for x .

YOU DO 1

A number, p , is rounded to 1 significant figure.

The result is 0.07.

Write down the error interval for p .

YOU DO 2

A number, m , is rounded to 2 significant figures.
The result is 4300.

Write down the error interval for m .

CHALLENGE**Mixed Exercise Challenge**

Write down the error intervals for the following numbers, taking careful note of the different rounding accuracies:

- (a) a is rounded to 1 decimal place to give 12.4
- (b) b is rounded to the nearest 10 to give 870
- (c) c is rounded to 3 significant figures to give 0.0500
- (d) d is rounded to the nearest integer to give 15

ANSWERS & WORKED SOLUTIONS**I Do**

Step 1: Identify the place value of the last significant figure. In 0.046, the '6' is in the thousandths column (0.001).

Step 2: Divide this value by 2 to find the maximum possible error. $0.001 \div 2 = 0.0005$.

Step 3: Subtract from the rounded value to find the lower bound. $0.046 - 0.0005 = 0.0455$.

Step 4: Add to the rounded value to find the upper bound. $0.046 + 0.0005 = 0.0465$.

Step 5: Write as an inequality. **Answer: $0.0455 \leq y < 0.0465$**

We Do

Step 1: Identify the place value of the last significant figure (5). It is in the hundredths column (0.01).

Step 2: Divide by 2: $0.01 \div 2 = 0.005$.

Step 3: Lower bound = $8.05 - 0.005 = 8.045$.

Step 4: Upper bound = $8.05 + 0.005 = 8.055$.

Step 5: Write as an inequality. **Answer: $8.045 \leq x < 8.055$**

You Do 1

Step 1: The last (and only) significant figure is the '7' in the hundredths column (0.01).

Step 2: Half of 0.01 is 0.005.

Step 3: Lower bound: $0.07 - 0.005 = 0.065$. Upper bound: $0.07 + 0.005 = 0.075$.

Answer: $0.065 \leq p < 0.075$

ANSWERS & WORKED SOLUTIONS (CONTINUED)

You Do 2

Step 1: The 2nd significant figure is the '3', which is in the hundreds column (100).

Step 2: Half of 100 is 50.

Step 3: Lower bound: $4300 - 50 = 4250$. Upper bound: $4300 + 50 = 4350$.

Answer: $4250 \leq m < 4350$

Mixed Exercise Challenge

(a) 1 d.p. means place value is 0.1. Half is 0.05. **Answer:** $12.35 \leq a < 12.45$

(b) Nearest 10 means place value is 10. Half is 5. **Answer:** $865 \leq b < 875$

(c) 3 s.f. for 0.0500 means the last '0' is the significant figure, in the ten-thousandths column (0.0001). Half is 0.00005. **Answer:** $0.04995 \leq c < 0.05005$

(d) Nearest integer means place value is 1. Half is 0.5. **Answer:** $14.5 \leq d < 15.5$