



- 1 The mass of a parcel is 340 g, correct to the nearest 10 g.
Complete the error interval for the mass, m grams, of the parcel.

..... $\leq m <$

(2 marks)

Rounding to the nearest 10 g means the true mass is within 5 g of 340 g

Lower bound

$$340 - 5 = 335. \text{ Upper bound: } 340 + 5 = 345$$

$$\text{So } 335 \leq m < 345$$

Include the lower boundary because a value exactly halfway rounds up to the stated result. Exclude the upper boundary because that halfway value rounds up to the next result instead.

$$335 \leq m < 345$$

- 2 The length of a pencil is 27 cm, correct to the nearest centimetre.
Complete the error interval for the length, L cm, of the pencil.

..... $\leq L <$

(2 marks)

Rounding to the nearest centimetre means the true length is within 0.5 cm of 27 cm

Lower bound

$$27 - 0.5 = 26.5. \text{ Upper bound: } 27 + 0.5 = 27.5$$

$$\text{So } 26.5 \leq L < 27.5$$

Include the lower boundary because a value exactly halfway rounds up to the stated result. Exclude the upper boundary because that halfway value rounds up to the next result instead.

$$26.5 \leq L < 27.5$$

- 3 The attendance at a football match is 5600, correct to the nearest 100

Complete the error interval for the attendance, n .

..... $\leq n <$

(2 marks)

Rounding to the nearest 100 means the true value is within 50 of 5600

Lower bound

$$5600 - 50 = 5550. \text{ Upper bound: } 5600 + 50 = 5650$$

$$\text{So } 5550 \leq n < 5650$$

Include the lower boundary because a value exactly halfway rounds up to the stated result. Exclude the upper boundary because that halfway value rounds up to the next result instead

$$5550 \leq n < 5650$$

- 4 The length of a ribbon is 7.5 m, correct to the nearest half metre.

Complete the error interval for the length, L metres, of the ribbon.

..... $\leq L <$

(2 marks)

Rounded to nearest 0.5

$$\text{Half of } 0.5 = 0.25$$

$$7.5 - 0.25 = 7.25$$

$$7.5 + 0.25 = 7.75$$

$$7.25 \leq L < 7.75$$

- 5 The mass of a cat is 8.3 kg, correct to 1 decimal place.

Complete the error interval for the mass, w kg, of the cat.

..... $\leq w <$

(2 marks)

Rounding to 1 decimal place means the true mass is within 0.05 kg of 8.3 kg

Lower bound

$$8.3 - 0.05 = 8.25. \text{ Upper bound: } 8.3 + 0.05 = 8.35$$

$$\text{So } 8.25 \leq w < 8.35$$

Include the lower boundary because a value exactly halfway rounds up to the stated result. Exclude the upper boundary because that halfway value rounds up to the next result instead

$$8.25 \leq w < 8.35$$

6

Ali says the crowd at a rugby match was 600, correct to the nearest 100.

Bea says the crowd at a different match was 600, correct to the nearest 10.

- Write down the error interval for the crowd Ali describes.
- Write down the error interval for the crowd Bea describes.
- Whose figure tells you the crowd size more accurately? Give a reason.

(4 marks)

a)

Half of 100 = 50

$$550 \leq n < 650$$

b)

Half of 10 = 5

$$595 \leq n < 605$$

c)

$$\text{Bea: } 605 - 595 = 10$$

$$\text{Ali: } 650 - 550 = 100$$

Bea, narrower interval

7

The time taken for a ball to roll down a ramp is 4.70 seconds, correct to 2 decimal places.

Complete the error interval for the time, t seconds.

..... $\leq t <$

(2 marks)

Rounding to 2 decimal places means the true time is within 0.005 seconds of 4.70

Lower bound

$$4.70 - 0.005 = 4.695. \text{ Upper bound: } 4.70 + 0.005 = 4.705$$

$$\text{So } 4.695 \leq t < 4.705$$

Include the lower boundary because a value exactly halfway rounds up to the stated result. Exclude the upper boundary because that halfway value rounds up to the next result instead

$$4.695 \leq t < 4.705$$

8

A bag of flour has a mass of 1.5 kg, correct to the nearest 0.1 kg.

a. Write down the error interval for the mass, m kg, of the flour.

b. Could the actual mass of the flour be exactly 1.55 kg? Give a reason for your answer.

(3 marks)

a)

Half of 0.1 = 0.05

$$1.5 - 0.05 = 1.45$$

$$1.5 + 0.05 = 1.55$$

$$1.45 \leq m < 1.55$$

b)

m must be less than 1.55

1.55 would round up to 1.6

No, 1.55 kg is not possible

9

A number d is truncated to 1 decimal place.

The result is 12.4

Complete the error interval for d .

..... $\leq d <$

(2 marks)

Truncating to 1 decimal place removes everything after the first decimal digit, so the value has not been rounded up

The value must be at least 12.4 but strictly less than 12.5. Removing the later digits from any value in this interval gives 12.4

$$\text{So } 12.4 \leq d < 12.5$$

$$12.4 \leq d < 12.5$$

10

A digital scale shows the weight of a suitcase as 52 kg.

The scale truncates the weight to a whole number of kilograms.

Complete the error interval for the weight, w kg, of the suitcase.

..... $\leq w <$

(2 marks)

Truncating to a whole number just removes the decimal part, so nothing is rounded up

The value must be at least 52 but strictly less than 53. Removing the later digits from any value in this interval gives 52

$$\text{So } 52 \leq w < 53$$

$$52 \leq w < 53$$

- 11 A number x is 470, correct to 2 significant figures.

Complete the error interval for x .

..... $\leq x <$

(2 marks)

To 2 significant figures, 470 has been rounded to the nearest 10

Lower bound

$$470 - 5 = 465. \text{ Upper bound: } 470 + 5 = 475$$

$$\text{So } 465 \leq x < 475$$

Include the lower boundary because a value exactly halfway rounds up to the stated result. Exclude the upper boundary because that halfway value rounds up to the next result instead

$$465 \leq x < 475$$

- 12 A number y is 0.08, correct to 1 significant figure.

Complete the error interval for y .

..... $\leq y <$

(2 marks)

To 1 significant figure, 0.08 has been rounded to the nearest 0.01

Lower bound

$$0.08 - 0.005 = 0.075. \text{ Upper bound: } 0.08 + 0.005 = 0.085$$

$$\text{So } 0.075 \leq y < 0.085$$

Include the lower boundary because a value exactly halfway rounds up to the stated result. Exclude the upper boundary because that halfway value rounds up to the next result instead

$$0.075 \leq y < 0.085$$

- 13 A number k is 15.0, correct to 3 significant figures.

Complete the error interval for k .

..... $\leq k <$

(2 marks)

To 3 significant figures, 15.0 has been rounded to the nearest 0.1 - the trailing zero counts as a significant figure

Lower bound

$$15.0 - 0.05 = 14.95. \text{ Upper bound: } 15.0 + 0.05 = 15.05$$

$$\text{So } 14.95 \leq k < 15.05$$

Include the lower boundary because a value exactly halfway rounds up to the stated result. Exclude the upper boundary because that halfway value rounds up to the next result instead

$$14.95 \leq k < 15.05$$

- 14 A number p is truncated to 2 decimal places.

The result is 7.26

Complete the error interval for p .

..... $\leq p <$

(2 marks)

Truncating to 2 decimal places removes every digit after the second decimal place, with no rounding up

The value must be at least 7.26 but strictly less than 7.27. Removing the later digits from any value in this interval gives 7.26

$$\text{So } 7.26 \leq p < 7.27$$

$$7.26 \leq p < 7.27$$

- 15 a. Write down the reciprocal of 0.4

- b. A number q is rounded to 2 significant figures.

The result is 2.5

Complete the error interval for q .

..... $\leq q <$

(3 marks)

$$\text{a) The reciprocal of 0.4 is } 1 / 0.4 = \frac{10}{4} = 2.5$$

b) To 2 significant figures, 2.5 has been rounded to the nearest 0.1

b) Lower bound

$$2.5 - 0.05 = 2.45. \text{ Upper bound: } 2.5 + 0.05 = 2.55, \text{ so } 2.45 \leq q < 2.55$$