



3.1F Error Intervals: Foundation Tier Practice

EDEXCEL Edexcel 1MA1 · Calculator allowed · about 50 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** A number is 240 correct to the nearest 10. Write down the error interval for this number.

(Total for Question 1 is 1 mark)

- 2** A length is given as 3.4 m, correct to 1 decimal place. Give the error interval for this value.

(Total for Question 2 is 1 mark)

- 3** A student writes a measurement as 0.72 correct to 2 decimal places.
Work out the error interval for the true value.

(Total for Question 3 is 2 marks)

- 4** A town records its weekly rainfall as 12 mm, correct to the nearest mm.
Write the error interval for the rainfall, and state the least possible value.

(a) Write the error interval for the rainfall. (1)

(b) State the least possible value of the rainfall. (1)

(Total for Question 4 is 2 marks)

- 5** A shop states that a jacket costs 39 pounds, correct to the nearest pound. A scarf costs 8 pounds, correct to the nearest pound.
Work out the smallest possible total cost of buying one jacket and one scarf. Give your answer in pounds.

(Total for Question 5 is 3 marks)

- 6** A length is 4.6 m correct to 1 decimal place. A second length is 2.31 m correct to 2 decimal places.
Work out the greatest possible value of the sum of the two lengths. Give your answer to 2 decimal places.

(Total for Question 6 is 3 marks)

- 7** A value x is given as 0.8 correct to 1 significant figure. A value y is given as 0.06 correct to 1 significant figure.
Work out the possible range for $x + y$. Give your answer as an inequality with lower bound and upper bound.

(Total for Question 7 is 4 marks)

- 8** A measurement is given as 25 correct to the nearest 5.
Work out the error interval and then find the least possible value of half of this measurement.

(a) Write the error interval for the measurement. (2)

.....
(b) Find the least possible value of half of this measurement. (2)

.....
(Total for Question 8 is 4 marks)

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- 9** A rectangle has length 6.3 m correct to 1 decimal place and width 2.45 m correct to 2 decimal places.

(a) Write down the error intervals for the length and the width.

(b) Work out the greatest possible area of the rectangle. Give your answer to 3 decimal places.

(a) Write the error intervals for the length and the width. (2)

.....
(b) Work out the greatest possible area. Give your answer to 3 decimal places. (4)

.....
(Total for Question 9 is 6 marks)

- 10** A metal cylinder has radius 1.2 cm, given to 2 significant figures, and height 3.4 cm, given to 1 decimal place.

Work out the least possible volume of the cylinder. Use $\pi = 3.142$ and give your answer to 2 decimal places. (Volume = $\pi * r^2 * h$.)

- (a) Write the error intervals for the radius and the height. (2)

- (b) Using the least possible radius and least possible height, work out the least possible volume. Give your answer to 2 decimal places using $\pi = 3.142$. (2)

(Total for Question 10 is 4 marks)

Mark scheme · 3.1F Error Intervals: Foundation Tier Practice

Question 1

- **B1** $235 \leq x < 245$ cao
- **Answer:** $235 \leq x < 245$

Question 2

- **B1** $3.35 \leq x < 3.45$ cao
- **Answer:** $3.35 \leq x < 3.45$

Question 3

- **M1** recognise half of last decimal place is 0.005 and set interval 0.72 ± 0.005
- **A1** $0.715 \leq x < 0.725$ cao
- **Answer:** $0.715 \leq x < 0.725$

Question 4

- (a) **B1** $11.5 \leq x < 12.5$ cao
- (a) **Answer:** $11.5 \leq x < 12.5$
- (b) **B1** 11.5 cao
- (b) **Answer:** 11.5

Question 5

- **M1** identify lower bounds: 38.5 and 7.5 and add them
- **A1** 46.0 cao
- **B1** answer given in pounds with clear units or correct formatting
- **Answer:** 46.0 (pounds)

Question 6

- **M1** identify upper bound for 4.6 as 4.65
- **M1** identify upper bound for 2.31 as 2.315 and add to get 6.965
- **A1** 6.97 cao to 2 dp
- **Answer:** 6.97 (m)

Question 7

- **M1** identify bounds for x: $0.75 \leq x < 0.85$ and for y: $0.055 \leq y < 0.065$
- **M1** add lower bounds and add upper bounds correctly
- **A1** $0.805 \leq x+y < 0.915$ cao
- **B1** inequality formatted correctly with lower and upper bounds
- **Answer:** $0.805 \leq x + y < 0.915$

Question 8

- (a) **M1** recognise rounding to nearest 5 gives half-interval 2.5 and form $22.5 \leq x < 27.5$
- (a) **A1** $22.5 \leq x < 27.5$ cao
- (a) **Answer:** $22.5 \leq x < 27.5$
- (b) **M1** take half of lower bound 22.5 giving 11.25
- (b) **A1** 11.25 cao
- (b) **Answer:** 11.25

Question 9

- (a) **M1** length interval: $6.25 \leq L < 6.35$ or $6.25 \leq L < 6.35$ (recognise half last dp 0.05)
- (a) **A1** $6.25 \leq L < 6.35$ and $2.445 \leq W < 2.455$ cao
- (a) **Answer: Length: $6.25 \leq L < 6.35$; Width: $2.445 \leq W < 2.455$**
- (b) **M1** use upper bounds for length and width: 6.35 and 2.455 and multiply
- (b) **M1** correct multiplication shown: $6.35 * 2.455 = 15.58925$
- (b) **A1** 15.58925 rounded to 3 dp: 15.589 cao
- (b) **B1** answer includes correct unit m^2 or stated as square metres
- (b) **Answer: 15.589 m^2**

Question 10

- (a) **M1** radius to 2 sf 1.2 gives $1.15 \leq r < 1.25$; height to 1 dp 3.4 gives $3.35 \leq h < 3.45$
- (a) **A1** $1.15 \leq r < 1.25$ and $3.35 \leq h < 3.45$ cao
- (a) **Answer: Radius: $1.15 \leq r < 1.25$; Height: $3.35 \leq h < 3.45$**
- (b) **M1** substitute lower bounds $r=1.15$ and $h=3.35$ into volume formula: $V = 3.142 * 1.15^2 * 3.35$
- (b) **A1** $V = 3.142 * 1.3225 * 3.35 = 13.92$ cao to 2 dp
- (b) **Answer: 13.92 cm^3**