3.1 Error Intervals: 30-minute Pack

EDEXCEL 1MA1 · Calculator allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A mass is recorded as 0.03, correct to 2 decimal places. Give the lower and upper bounds in inequality form.

(Total for Question 1 is 1 mark)

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2 Write down the bounds for 4.00, correct to 3 significant figures, using inequality notation.

(Total for Question 2 is 1 mark)

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

(Total for Question 3 is 1 mark)

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4 The distance of a journey is 727 km, correct to the nearest 1 km.
Write down the error interval for the distance, using the letter d.

(Total for Question 4 is 2 marks)

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5 The height of a tree is 9.4 m. The value has been truncated to the nearest 0.1 m (rounded down).
Write down the error interval for the height, using the letter h.

(Total for Question 5 is 2 marks)

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6 The capacity of a jug is 7920 ml, correct to the nearest 10 ml.
Write down the error interval for the capacity, using the letter c.

(Total for Question 6 is 2 marks)

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7 The length of a table is 1.4 cm when rounded to 2 significant figures.
Write down the error interval for the length, using the letter l.

(Total for Question 7 is 3 marks)

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8 The mass of a parcel is 271 kg, correct to the nearest 1 kg.
Rosa says the exact mass could be 271.5 kg. Is Rosa correct? You must show your working.

(Total for Question 8 is 2 marks)

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9 A shop states that a jacket costs £39, correct to the nearest pound. A scarf costs £8, 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 9 is 3 marks)

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10 x is 12, correct to the nearest integer. Let y = x/3. Find the range of possible values of y, giving your answer in exact fractional form with inequalities.

(Total for Question 10 is 3 marks)

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11 A cylindrical rod has radius 2.5 cm (to 2 significant figures) and height 40 cm (to the nearest centimetre). Find an inequality giving the range of possible volumes. Give numeric bounds.

(Total for Question 11 is 4 marks)

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Mark scheme · 3.1 Error Intervals: 30-minute Pack

Question 1

$0.025 \leq x < 0.035$ cao	**B1**

Answer: $0.025 \leq x < 0.035$

Question 2

$3.995 \leq x < 4.005$ cao	**B1**

Answer: $3.995 \leq x < 4.005$

Question 3

$235 \leq x < 245$ cao	**B1**

Answer: $235 \leq x < 245$

Question 4

lower limit with $\leq$	**B1**
upper limit with $<$	**B1**

Answer: $726.5 \leq d < 727.5$

Question 5

lower limit 9.4 with $\leq$	**B1**
upper limit 9.5 with $<$	**B1**

Answer: $9.4 \leq h < 9.5$

Question 6

lower limit with $\leq$	**B1**
upper limit with $<$	**B1**

Answer: $7915 \leq c < 7925$

Question 7

identifies the rounding unit as 0.1	**M1**
lower limit with $\leq$	**B1**
upper limit with $<$	**B1**

Answer: $1.35 \leq l < 1.45$

Question 8

limits 270.5 and 271.5 found	**M1**
correct conclusion with comparison to the limits	**A1**

Answer: No

Question 9

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

Answer: 46.0 (pounds)

Question 10

divide bounds $11.5 \leq x < 12.5$ by 3	**M1**
write bounds as fractions $23/6 \leq y < 25/6$	**M1**
$23/6 \leq y < 25/6$ cao	**A1**

Answer: $23/6 \leq y < 25/6$. WorkingCheck: x bounds 11.5 and 12.5; 11.5/3 = 23/6, 12.5/3 = 25/6.

Question 11

state bounds r: $2.45 \leq r < 2.55$ and h: $39.5 \leq h < 40.5$	**M1**
form inequality for volume: $\pi*(2.45)^2*39.5 \leq V < \pi*(2.55)^2*40.5$	**M1**
evaluate lower bound to 3 significant figures or better	**A1**
evaluate upper bound to 3 significant figures or better	**A1**

Answer: $\pi*(2.45)^2*39.5 \leq V < \pi*(2.55)^2*40.5$. Numerically: 744.868... $cm^3 \leq V < 827.342...$ cm^3. WorkingCheck: $(2.45)^2*39.5 = 237.09875$, $*\pi = 237.09875*\pi =$ approx 744.868; $(2.55)^2*40.5 = 263.35125$, $*\pi =$ approx 827.342.

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