Error intervals - Worksheet

Skill

Group A - Error intervals of rounded values

Find the error intervals for the rounded values x.

1) $6cm$ to the nearest cm

2) $52\ g$ to the nearest gram

3) $120km$ to the nearest $10km$

4) $40\ cm$ to the nearest $10cm$

5) $500ml$ to the nearest $100ml$

6) $2100\ kg$ to the nearest $100kg$

7) $9000m$ to the nearest $1000m$

8) $28000\ mm$ to 2 significant figures

9) $23.7l$ to 1 decimal place

10) $38.26\ seconds$ to 2 decimal places

11) $0.04m$ to 1 significant figure

12) $0.749\ km$ to 3 decimal places

Group B - Error intervals of truncated values

Find the error intervals for the truncated values y.

1) 8 to the integer

2) 31 to the integer

3) 50 to the tens

4) 480 to the tens

5) 300 to the hundreds

6) 7200 to the hundreds

7) 32.5 to 1 decimal place

8) 0.62 to 2 decimal places

9) 1.537 to 3 decimal places

10) 0.03 to 1 significant figure

11) 3.6 to 2 significant figures

12) 74600 to 3 significant figures

Error intervals - Worksheet

Group C - Error intervals of rounded or truncated values

Find the error intervals for the values z.

1) $250m$ truncated to the tens

2) $780cm$ to the nearest $10cm$

3) $3420m$ truncated to 3 significant figures

4) $6.7\ cm$ to the nearest mm

5) 29.38 rounded to 2 decimal places

6) 765 truncated to the integer

7) $0.3km$ rounded to 1 decimal place

8) 400 rounded to 1 significant figure

9) 0.0056 rounded to 2 significant figures

10) $4.728m$ truncated to 3 decimal places

11) $81000km$ truncated to the thousands

12) $67.2cm$ rounded to 1 decimal place

Error intervals - Worksheet

Applied

1) **(a)** A measurement x was rounded to the nearest 10cm and given the error interval. $45cm \leq x < 55\ cm$.

What was the rounded measurement?

(b) It is discovered that the measurement was not rounded to the nearest $10cm$ but truncated to the integer.

What is the new error interval for x?

2) **(a)** Simon writes the error interval for a time rounded to the nearest tenth of a second as $11.35s \leq x < 11.44\ s$.

What mistake has Simon made?

(b) Kim has written the error interval for an age truncated to the integer as 27 years $\leq x \leq 28$ years.

What mistake has Kim made?

3) **(a)** The height of a bookcase, b, is $212cm$ to the nearest cm. A room, r, is $2124mm$ high to the nearest mm.

Write error intervals for the heights of the bookcase, b and the room, r.

(b) By considering the error intervals in part a, will the bookcase fit in the room?

4) **(a)** Dean was finding the area of a compound shape. He was going to find two areas A and B and then add them together. Dean's calculator was broken and kept truncating his answers to 2 decimal places. Area A was given as $34.62\ cm^2$ and area B was $27.28\ cm^2$.

Write error intervals for A and B.

(b) Write an error interval for the area of Dean's compound shape.

Error intervals - Exam Questions

1) Kevin truncates the number x to one decimal place. The result is 8.4.

Write the error interval for x.

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(2 marks)

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2) Ana rounds the number y to 2 significant figures. The result is 7200.

Write the error interval for y.

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(2 marks)

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3) Amir measures a door to be $782mm$ wide to the nearest mm.

Write the error interval for the width of the door, w.

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(2 marks)

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4) Lucy measures the volume of some liquid as $25.73ml$ to 2 decimal places.

Write the error interval for the volume of liquid, v.

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(2 marks)

Error intervals - Exam Questions

5) Olivia calculates an angle of a triangle and truncates her answer to $46.73°$.

Write the error interval for the angle, θ.

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(2 marks)

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6) Juan rounds the number n to 3 significant figures. The result is 0.371.

Write the error interval for n.

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(2 marks)

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7) **(a)** The perimeter, P, of a square is measured as $28cm$ to the nearest cm.

Write the error interval for P.

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(2 marks)

(b) Hence, find the error interval for the side length, l, of the square,

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(2 marks)

Error intervals - Answers

	Question	Answer
	Skill Questions	
Group A	Find the error intervals for the rounded values x: **1)** $6cm$ to the nearest cm **2)** $52g$ to the nearest gram **3)** $120km$ to the nearest $10km$ **4)** $40cm$ to the nearest $10cm$ **5)** $500ml$ to the nearest $100ml$ **6)** $2100kg$ to the nearest $100kg$ **7)** $9000m$ to the nearest $1000m$ **8)** $28000mm$ to 2 significant figures **9)** $23.7l$ to 1 decimal place **10)** $38.26\ seconds$ to 2 decimal places **11)** $0.04m$ to 1 significant figure **12)** $0.749km$ to 3 decimal places	 **1)** $5.5cm \leq x < 6.5cm$ **2)** $51.5g \leq x < 52.5g$ **3)** $115km \leq x < 125km$ **4)** $35cm \leq x < 45\ cm$ **5)** $450\ ml \leq x < 550ml$ **6)** $2050\ kg \leq x < 2150kg$ **7)** $8500m \leq x < 9500m$ **8)** $27500mm \leq x < 28500mm$ **9)** $23.65l \leq x < 23.75l$ **10)** $38.255s \leq x < 38.265s$ **11)** $0.035m \leq x < 0.045m$ **12)** $0.7485km \leq x < 0.7495km$
Group B	Find the error intervals for the truncated values y: **1)** 8 to the integer **2)** 31 to the integer **3)** 50 to the tens **4)** 480 to the tens **5)** 300 to the hundreds **6)** 7200 to the hundreds **7)** 32.5 to 1 decimal place **8)** 0.62 to 2 decimal places **9)** 1.537 to 3 decimal places **10)** 0.03 to 1 significant figure **11)** 3.6 to 2 significant figures **12)** 74600 to 3 significant figures	 **1)** $8 \leq y < 9$ **2)** $31 \leq y < 32$ **3)** $50 \leq y < 60$ **4)** $480 \leq y < 490$ **5)** $300 \leq y < 400$ **6)** $7200 \leq y < 7300$ **7)** $32.5 \leq y < 32.6$ **8)** $0.62 \leq y < 0.63$ **9)** $1.537 \leq y < 1.538$ **10)** $0.03 \leq y < 0.04$ **11)** $3.6 \leq y < 3.7$ **12)** $74600 \leq y < 74700$

Error intervals - Answers

Group C	Find the error intervals for the values z:	
	1) $250m$ truncated to the tens	**1)** $250m \leq z < 260m$
	2) $780cm$ to the nearest $10cm$	**2)** $775cm \leq z < 785cm$
	3) $3420m$ truncated to 3 significant figures	**3)** $3420m \leq z < 3430m$
	4) $6.7cm$ to the nearest mm	**4)** $6.65cm \leq z < 6.75cm$
	5) 29.38 rounded to 2 decimal places	**5)** $29.375 \leq z < 29.385$
	6) 765 truncated to the integer	**6)** $765 \leq z < 766$
	7) $0.3km$ rounded to 1 decimal place	**7)** $0.25km \leq z < 0.35km$
	8) 400 rounded to 1 significant figure	**8)** $350 \leq z < 450$
	9) 0.0056 rounded to 2 significant figures	**9)** $0.00555 \leq z < 0.00565$
	10) $4.728m$ truncated to 3 decimal places	**10)** $4.728m \leq z < 4.729m$
	11) $81000km$ truncated to the thousands	**11)** $81000km \leq z < 82000km$
	12) $67.2cm$ rounded to 1 decimal place	**12)** $67.15cm \leq z < 67.25cm$

Error intervals - Answers

	Question	Answer
	Applied Questions	
1)	**a)** A measurement x was rounded to the nearest $10cm$ and given the error interval $45cm \leq x < 55cm$. What was the rounded measurement?	**a)** $x = 50cm$
	b) It is discovered that the measurement was not rounded to the nearest $10cm$ but truncated to the integer. What is the new error interval for x?	**b)** $50cm \leq x < 51cm$
2)	**a)** Simon writes the error interval for a time rounded to the nearest tenth of a second as $11.35s \leq x < 11.44\,s$. What mistake has Simon made?	**a)** Maximum should be $11.45s$.
	b) Kim has written the error interval for an age truncated to the integer as $27 \text{ years} \leq x \leq 28 \text{ years}$. What mistake has Kim made?	**b)** The second inequality symbol should be strictly less than, <. $27 \text{ years} \leq x < 28 \text{ years}$.
3)	**a)** The height of a bookcase, b, is $212cm$ to the nearest cm. A room, r, is $2124mm$ high to the nearest mm. Write error intervals for the heights of the bookcase, b and the room, r.	**a)** $211.5cm \leq b < 212.5cm$ $2123.5mm \leq r < 2124.5mm$
	b) By considering the error intervals in part a, will the bookcase fit in the room?	**b)** The maximum of the bookcase is greater than the maximum of the room so it might not fit.

Error intervals - Answers

4)	**a)** Dean was finding the area of a compound shape. He was going to find two areas A and B and then add them together. Dean's calculator was broken and kept truncating his answers to 2 decimal places. Area A was given as $34.62cm^2$ and area B was $27.28cm^2$. Write error intervals for A and B.	**a)** $34.62cm^2 \leq A < 34.63cm^2$ $27.28cm^2 \leq B < 27.29cm^2$
	b) Write an error interval for the area of Dean's compound shape.	**b)** $61.90cm^2 \leq A + B < 61.92cm^2$

Error intervals - Mark Scheme

	Question	Answer	
	Exam Questions		
1)	Kevin truncates the number x to one decimal place. The result is 8. 4. Write the error interval for x.	8. 4 or 8. 5 $8.4 \leq x < 8.5$	**(1)** **(1)**
2)	Ana rounds the number y to 2 significant figures. The result is 7200. Write the error interval for y.	7150 or 7250 $7150 \leq y < 7250$	**(1)** **(1)**
3)	Amir measures a door to be $782mm$ wide to the nearest mm. Write the error interval for the width of the door, w.	781. 5 or 782. 5 $781.5mm \leq w < 782.5mm$	**(1)** **(1)**
4)	Lucy measures the volume of some liquid as $25.73ml$ to 2 decimal places. Write the error interval for the volume of liquid, v.	25. 725 or 25. 735 $25.725ml \leq v < 25.735ml$	**(1)** **(1)**
5)	Olivia calculates an angle of a triangle and truncates her answer to 46. 73°. Write the error interval for the angle, θ.	46. 73° or 46. 74° $46.73° \leq \theta < 46.74°$	**(1)** **(1)**
6)	Juan rounds the number n to 3 significant figures. The result is 0. 371. Write the error interval for n.	0. 3705 or 0. 3715 $0.3705 \leq n < 0.3715$	**(1)** **(1)**
7) (a)	The perimeter, P, of a square is measured as $28cm$ to the nearest cm. Write the error interval for P.	**(a)** 27. 5 or 28. 5 $27.5cm \leq P < 28.5cm$	**(1)** **(1)**
(b)	Hence, find the error interval for the side length, l, of the square.	**(b)** $27.5 \div 4$ or $28.5 \div 4$ 6. 875 or 7. 125 $6.875cm \leq l < 7.125cm$	**(1)** **(1)**