FOUNDATION & HIGHER

HIGHER EXTENDS

Name ..... Class .....

N16: Bounds

Upper and lower bounds; limits of accuracy

20 marks · 25 minutes · Calculator allowed

1) A length is 8.4 cm, correct to 1 decimal place. Write down its upper bound and its lower bound.

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[Question 1: 2 marks]

2) A rectangle measures 12 cm by 7 cm. Each length is correct to the nearest centimetre.

(a) Find the upper bound of its area.

..... cm^2

(2)

(b) Find the lower bound of its area.

..... cm^2

(1)

[Question 2: 3 marks]

3) A runner runs 100 m, correct to the nearest metre, in 12.4 seconds, correct to the nearest 0.1 second. Find the upper bound of her average speed. Give your answer to 3 decimal places.

..... m/s

[Question 3: 3 marks]

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4) $a = 6.2$ and $b = 3.8$, both correct to 1 decimal place. Find the upper bound of $a - b$.

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[Question 4: 2 marks]

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5) A metal block has a volume of 240 cm^3, correct to the nearest 10 cm^3, and a mass of 1.7 kg, correct to the nearest 0.1 kg. Find the lower bound of its density in g/cm^3. Give your answer to 3 significant figures.

..... g/cm^3

[Question 5: 3 marks]

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6) A lift can carry at most 800 kg. Ten people each have a mass of 75 kg, correct to the nearest kg. Show that the lift can definitely carry all ten people.

[Question 6: 2 marks]

7) x = 3.47 to 3 significant figures and y = 1.2 to 2 significant figures. Find the value of $\frac{x}{y}$ to a suitable degree of accuracy. Give a reason for your answer.

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[Question 7: 3 marks]

8) A square has sides of 4.6 cm, correct to 1 decimal place. Find the upper bound of its perimeter.

..... cm

[Question 8: 2 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	8.45 and 8.35	B1 each.
2	(a) 93.75 (b) 74.75	(a) 12.5×7.5 (M1); A1. (b) B1.
3	8.138	100.5 and 12.35 (M1); $100.5 \div 12.35$ (M1); 8.138 (A1).
4	2.5	$6.25 - 3.75$ (M1); A1.
5	6.73	1650 g and 245 cm^3 (M1); $1650 \div 245$ (M1); 6.73 (A1).
6	Shown	$10 \times 75.5 = 755$ (M1); $755 < 800$ (A1).
7	3	LB $3.465 \div 1.25 = 2.772$ (M1); UB $3.475 \div 1.15 = 3.0217\ldots$ (M1); both round to 3 to 1 s.f. (A1).
8	18.6	4×4.65 (M1); A1.