MASTER MATHS GCSE

GCSE Mathematics 9-1

Error Intervals and Bounds

(Non-Calculator)

Mark Scheme

Total available marks: 44

Q	Answer	Working	Mark
1	$15.65 \leq w < 15.75$	Half of the accuracy (1 decimal place) is 0.05 Lower: 15.65 Upper: 15.75	1
2	$0.4055 \leq n < 0.4065$	Half of the accuracy (3 decimal places) is 0.0005 Lower: 0.4055 Upper: 0.4065	1
3	$745 \leq n < 755$	Correct to 2 significant figures, the 2nd significant figure is the tens, so half of $10 = 5$ Lower: 745 Upper: 755	1
4	$315 \leq m < 325$	Half of the accuracy (the nearest 10 miles) is 5 Lower: 315 Upper: 325	1
5	$6.085 \leq d < 6.095$	Half of the accuracy (2 decimal places) is 0.005 Lower: 6.085 Upper: 6.095	1
6	$0.0035 \leq \text{mass} < 0.0045$	Correct to 1 significant figure, the 1st significant figure is the thousandths, so half of $0.001 = 0.0005$ Lower: 0.0035 Upper: 0.0045	1
7	$1.815 \leq \text{height} < 1.825$	Half of the accuracy (2 decimal places) is 0.005 Lower: 1.815 Upper: 1.825	1
8	$9350 \leq \text{number} < 9450$	Correct to 2 significant figures, the 2nd significant figure is the hundreds, so half of $100 = 50$ Lower: 9350 Upper: 9450	1
9	$2.345 \leq \text{measurement} < 2.355$	Half of the accuracy (2 decimal places) is 0.005 Lower: 2.345 Upper: 2.355	1
10	$55 \leq \text{number} < 65$	Half of the accuracy (the nearest 10) is 5 Lower: 55 Upper: 65	1
11	Upper bound: 14.25 m Lower bound: 14.15 m	Half of the accuracy (1 decimal place) is 0.05 Lower: 14.15 Upper: 14.25	2
12	Upper bound: 23.45 s Lower bound: 23.35 s	Half of the accuracy (1 decimal place) is 0.05 Lower: 23.35 Upper: 23.45	2
13	Upper bound: 1.255 m Lower bound: 1.245 m	Half of the accuracy (2 decimal places) is 0.005 Lower: 1.245 Upper: 1.255	2
14	$85\,500 \leq \text{population} < 86\,500$	Correct to 2 significant figures, the 2nd significant figure is the thousands, so half of $1000 = 500$ Lower: 85 500 Upper: 86 500	1

Q	Answer	Working	Mark
15	Upper bound: 0.725 Lower bound: 0.715	Half of the accuracy (2 decimal places) is 0.005 Lower: 0.715 Upper: 0.725	2
16	Upper bound: 0.505 kg Lower bound: 0.495 kg	Half of the accuracy (2 decimal places) is 0.005 Lower: 0.495 Upper: 0.505	2
17	Upper bound: 775 m Lower bound: 725 m	Half of the accuracy (the nearest 50) is 25 Lower: 725 Upper: 775	2
18	$3.55 \leq d < 3.65$	Correct to 2 significant figures, the 2nd significant figure is the tenths, so half of $0.1 = 0.05$ Lower: 3.55 Upper: 3.65	1
19	Upper bound: 52.5 cm^3 Lower bound: 51.5 cm^3	Half of the accuracy (the nearest cm^3) is 0.5 Lower: 51.5 Upper: 52.5	2
20	Upper bound: 105 km/h Lower bound: 95 km/h	Half of the accuracy (the nearest 10 km/h) is 5 Lower: 95 Upper: 105	2
21	3.65 kg	Half of 0.1 is 0.05 $3.6 + 0.05$ (the upper bound)	1
22	1.95 kg	Half of 0.1 is 0.05 $2.0 - 0.05$ (the lower bound)	1
23	304	The real number is at least 295 and less than 305 Cows are whole numbers, so the most is 304	1
24	Upper bound: 2.675 m Lower bound: 2.625 m	Half of the accuracy (the nearest 0.05) is 0.025 Lower: 2.625 Upper: 2.675	2
25	2 h 27.5 min ≤ journey < 2 h 32.5 min	Half of 5 minutes is 2.5 minutes 2 h 30 min − 2.5 min and 2 h 30 min + 2.5 min	1
26	$46.5 \leq x < 47.5$	Half of the accuracy (the nearest integer) is 0.5 Lower: 46.5 Upper: 47.5	1
27	$3.185 \leq x < 3.195$	Half of the accuracy (2 decimal places) is 0.005 Lower: 3.185 Upper: 3.195	1
28	$8.35 \leq x < 8.45$	Half of the accuracy (1 decimal place) is 0.05 Lower: 8.35 Upper: 8.45	1
29	$0.755 \leq x < 0.765$	Half of the accuracy (2 decimal places) is 0.005 Lower: 0.755 Upper: 0.765	1

Q	Answer	Working	Mark
30	$0.004515 \leq x < 0.004525$	Correct to 3 significant figures, the 3rd significant figure is the hundred-thousandths, so half of $0.00001 = 0.000005$ Lower: 0.004515 Upper: 0.004525	1
31	$65 \leq x < 75$	Correct to 1 significant figure, the 1st significant figure is the tens, so half of $10 = 5$ Lower: 65 Upper: 75	1
32	$3150 \leq x < 3250$	Half of the accuracy (the nearest hundred) is 50 Lower: 3150 Upper: 3250	1
33	$5.05 \leq x < 5.15$	Half of the accuracy (1 decimal place) is 0.05 Lower: 5.05 Upper: 5.15	1
34	$0.00225 \leq x < 0.00235$	Correct to 2 significant figures, the 2nd significant figure is the ten-thousandths, so half of $0.0001 = 0.00005$ Lower: 0.00225 Upper: 0.00235	1
35	$-4.65 \leq x < -4.55$	Half of the accuracy (1 decimal place) is 0.05 Lower: -4.65 Upper: -4.55	1

Total available marks for this paper	**44**