	Upper and Lower bounds Mark Scheme:	
1(a)	lower bound = 5.5 cm	[1]
	upper bound = 6.5 cm	[1]
1(b)	lower bound = 2.15 kg	[1]
	upper bound = 2.25 kg	[1]
1(c)	55 m	[1] Answer to the nearest meter
2(a)	max. area: $4.15\,m \times 3.25\,m = 13.4875\,m^2$	[1] Correct calculation
	min area: $4.05\,m \times 3.15 = 12.7575\,m^2$	[1] Correct calculation
	Max area = 13.5 m^2 , Min area =12.8 m^2	[1] Both correct to 1 d.p.
3	No	[1] Only award with correct explanation
	$Min\ speed = \frac{225}{4}$, $Max\ Speed = \frac{235}{4}$	[1] Correct use of formula and bounds (Accept method using upper and lower bounds of Time to show Sarah is wrong.)
	The average speed is between 56.25 and 58.75 mph	[1] Correct final answer
4(a)	x Lower bound = 3.415 m Upper bound = 3.425 m	[1] Upper and lower bound of x
	y Lower bound = 0.915 m Upper bound = 0.925 m	[1] Upper and lower bound of y
4(b)	min. $z = \frac{1}{3.425} + 0.915 = 1.207\ (to\ 3\ d.p)$	[1] Lower bound of z
	max. $z = \frac{1}{3.415} + 0.925 = 1.218$ $(to\ 3\ d.p.)$	[1] Upper bound of z
5(a)	Upper bound = $9.05 \times 8.55 \times 18.25$	[1] Correct calculation
	$= 1412.14 cm^3$	[1] Volume to 2 d.p.
5(b)	Upper bound the water = $1375 cm^3$	[1] Upper bound
	Lower bound of the bucket $8.95 \times 8.45 \times 18.15 = 1372.63 cm^3$	[1] Lower bound
	Yes, the container could overflow. The upper bound of water is greater then the lower bound of the container volume.	[1] Correct conclusion based on workings
6(a)	12.35 m	[1] Lower bound for distance
6(b)	Correct use of g = 9.85	[1] Implicit in question
	$t = \sqrt{\frac{2 \times 12.35}{9.85}} = 1.584$	[1] Correct calculation
	$t = 1.58$ seconds	[1] Min. time to 2 d.p.

END