Upper and Lower Bounds

1) Write down the greatest lower bound and least upper bound for each of the following:

(a) 3.8cm (to 2sf)
(b) 3.80cm (to 3sf)
(c) 3.8cm (to the nearest 0.2cm)
(d) 400 m (to 2sf)
(e) 1.35m (to nearest cm)
(f) 1.35m (to nearest 5cm)

2) I have a plan of the school grounds on a scale of 1:n. I measure the distance from the door to the gate as 5.3cm (to the nearest mm) on the map, and 100m (to nearest 10m) on the ground.
(a) Find the largest possible value of n
(b) If the distance from the pond to the gate is measured as 7.8cm (to nearest mm) on the map), find the largest possible distance it could be on the ground.
Repeat (a) and (b) replacing "largest" by "smallest"

3) Triangle ABC is right-angled at A. AB = 7.6cm (to nearest 0.2cm). BC = 13.0cm (to 3sf). Use Pythagoras to find the greatest lower bound and least upper bound of the length of AC.

4) If x = 80 (to the nearest 5) and y = 30 (to the nearest 10), find the greatest lower bound and least upper bound of the value of $\frac{x}{y}$. Find also the maximum possible error that could occur in using the given values to calculate $\frac{x}{y}$.

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