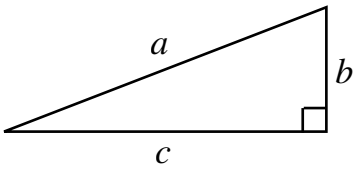
Error Intervals with Discrete Quantities

Starter

1. **(Review of last lesson)**
The length a is 9.2 cm, correct to the nearest mm.
The length b is 4.7 cm, correct to the nearest mm.
Calculate the upper bound for c, giving your answer to 3 s.f..



Working:
$9.15 \leq a < 9.25$
$4.65 \leq b < 4.75$
Upper bound of $c = \sqrt{\left(\text{ub}(a)\right)^2 - \left(\text{lb}(b)\right)^2}$
$= \sqrt{9.25^2 - 4.65^2}$
$= 8.00$

2. **(Review of last lesson)** The maximum safe load of a lift is 1500 kg, to the nearest 50 kg. The lift is loaded with boxes weighing 141 kg and 150 kg, both weights given to the nearest kilogram. Can the lift safely carry three boxes weighing 141 kg each and seven boxes weighing 150 kg each? You must show all your working.

Working: Maximum weight of the boxes is $3 \times 141.5 + 7 \times 150.5 = 1478$ kg
Maximum safe load $\equiv$ Lower bound $= 1475$ kg
Since $1475 < 1478$, the load cannot be safely carried.

E.g. 1 The price of a cell phone is £320 to the nearest pound. Write down the best answer for the error interval for the price of the phone.

Working: The best answer is £$319.50 \leq$ price $\leq$ £320.49
Since money is discrete, £$319.50 \leq$ price $<$ £320.50 would not be considered correct.

E.g. 2 The crowd at a match was estimated at 15400 to the nearest hundred. Write down the error interval for the crowd.

Working: Error interval: $15350 \leq$ crowd ≤ 15449

E.g. 3 Simon bought audio items and gives their approximate costs. Prices up to £15 are given to the nearest £1. Prices over £15 are given to the nearest £5. Simon bought a CD player, a CD costing £12 and headphones costing £20. He says that he paid £150 in total. This total is given to the nearest £10. Find the maximum possible price which Simon could have paid for the CD player.

Working: Upper bound (CD player) = ub(total) − lb(CD) − lb(headphones)
= £154.99 − £11.50 − £17.50
= £125.99

Solutions to Starter and E.g.s

Exercise

9-1 class textbook:	No exercise
A*-G class textbook:	No exercise
9-1 homework book:	No exercise
A*-G homework book:	No exercise