Tolerance

Reminder: *'the tolerance in a measurement is the difference between greatest and least acceptable measurements'*

Example: For a mass of (15 ±0·5)g the greatest and least acceptable masses are 15·5g and 14·5g, and the tolerance is 1g.

1. Give the greatest and least acceptable measurements for the following:

   a) (12 ±1)g   b) (76 ±2)m

   c) (4·3 ±0·1)cm   d) (6·3 ±0·5)s

   e) (48 ±0·35)kg   f) (1·4 ±0.05)cm

2. A box of drawing pins contains 50 ±5 pins. What is the minimum number of pins acceptable in any box?

3. A set of fitness weights are manufactured with a tolerance of ±80g. Write down the maximum and minimum possible weights of a 5kg dumbbell. (**Answer in g**)

4. A company manufactures PVC windows to a tolerance of ±2mm.
    A window is ordered measuring 90cm by 60cm.
    Write down the dimensions of the largest possible window that would be acceptable. (**Answer in mm**)

5. The actual weight of corn flakes in a box is claimed to be ±5% of what is labelled on the box.
    A 500g box has its contents weighed and the actual weight of corn flakes is 469g.
    Is this acceptable according to the tolerance given? **Explain your answer.**

6. Pieces of tubing are required with lengths given by (6 ±0·2)cm.
    Which of the following will be accepted, and which rejected?

    a) 6·3cm   b) 5·6cm   c) 6·09cm
    d) 5·82cm   e) 5·98cm   f) 6·18cm

7. A GPS sports watch measures the distance covered by a runner. It is accurate to ±50m.
    According to the watch, a runner covers 1·75km in 6 minutes.
    What is the fastest possible speed of the runner?