**Question 1**

1) Dan does an experiment to find the value of \( \pi \).
   
   He measures the circumference and the diameter of a circle.
   He measures the circumference, \( C \), as 170 mm to the nearest millimetre.
   He measures the diameter, \( d \), as 54 mm to the nearest millimetre.
   Dan uses \( \pi = \frac{C}{d} \) to find the value of \( \pi \).
   Calculate the upper bound and the lower bound for Dan’s value of \( \pi \).

**Question 2**

Sasha drops a ball from a height of \( d \) metres onto the ground.

The time, \( t \) seconds, that the ball takes to reach the ground is given by

\[
t = \sqrt{\frac{2d}{g}}
\]

where \( g \) m/s\(^2\) is the acceleration due to gravity.

\( d = 35.6 \) correct to 3 significant figures.
\( g = 9.8 \) correct to 2 significant figures.

(a) Write down the lower bound of \( d \).

(b) Calculate the lower bound of \( t \).
   You must show all your working.
Question 3

3) A solid sphere has

- a mass of 1180 g measured to the nearest gram
- and a radius of 6.2 cm measured to the nearest millimetre.

Given that \( Density = \frac{mass}{volume} \)

find the upper bound for the density of the sphere.

Give your answer to 3 significant figures.

Question 4

*4) \( m = \frac{\sqrt{s}}{t} \)

- \( s = 3.47 \) correct to 2 decimal places
- \( t = 8.132 \) correct to 3 decimal places

By considering bounds, work out the value of \( m \) to a suitable degree of accuracy.

You must show all your working and give a reason for your final answer.

Question 5

John ran a race at his school. The course was measured at 450m correct to 2 significant figures and his time was given as 62 seconds to the nearest second. Calculate the difference between his maximum and minimum possible average speed.

Round your answer to 3 significant figures.