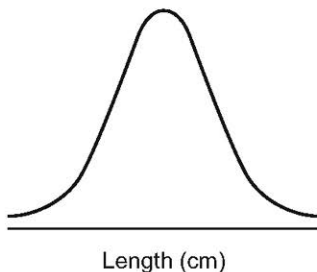


17 In 2019, the lengths of new-born babies at a clinic can be modelled by a normal distribution with mean 50 cm and standard deviation 4 cm.

17 (a) This normal distribution is represented in the diagram below.
Label the values 50 and 54 on the horizontal axis.

[2 marks]



17 (b) State the probability that the length of a new-born baby is less than 50 cm.

[1 mark]

17 (c) Find the probability that the length of a new-born baby is more than 56 cm.

[1 mark]

17 (d) Find the probability that the length of a new-born baby is more than 40 cm but less than 60 cm.

[1 mark]

17 (e) Determine the length exceeded by 95% of all new-born babies at the clinic.

[2 marks]

17 (f) In 2020, the lengths of 40 new-born babies at the clinic were selected at random.
The total length of the 40 new-born babies was 2060 cm.

Carry out a hypothesis test at the 10% significance level to investigate whether the mean length of a new-born baby at the clinic in 2020 has increased compared to 2019.

You may assume that the length of a new-born baby is still normally distributed with standard deviation 4 cm.

[7 marks]