Exercise 15K

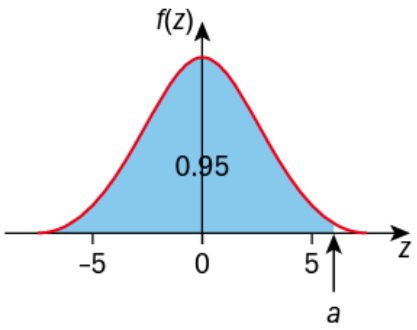
1 Find a such that:

a $P(Z < a) = 0.922$ **b** $P(Z > a) = 0.342$

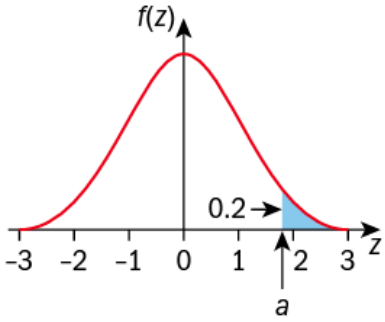
c $P(Z > a) = 0.005$

4 Find the values of a shown in these diagrams:

a



b



Exercise 15L

1 $X \sim N(5.5, 0.2^2)$ and $P(X > a) = 0.235$ Find the value of a.

2 The mass, M, of a randomly chosen tin of dog food is such that $M \sim N(420, 10^2)$. Find

a the first quartile **b** the 90th percentile.

EXAM-STYLE QUESTION

3 Regulations in a country insist that all mineral bottles that claim to contain 500 ml must have at least that amount. 'Yummy Cola' has a machine for filling bottles, which puts an average of 502 ml into each bottle with a standard deviation of 1.6 ml and follows a normal distribution.

a An inspector randomly selects a bottle of 'Yummy Cola'. What is the probability that it will break the regulations?

b What proportion of bottles will contain between 500 ml and 505 ml?

c 95% of bottles contain between a ml and b ml of liquid where a and b are symmetrical about the mean. What are a and b?

Exercise 15M

1 $X \sim N(30, \sigma^2)$ and $P(X > 40) = 0.115$. Find the value of σ.

2 $X \sim N(\mu, 4^2)$ and $P(X < 20.5) = 0.9$. Find the value of μ.

3 $X \sim N(\mu, \sigma^2)$. Given that $P(X > 58.39) = 0.0217$ and $P(X < 41.82) = 0.0287$, find μ and σ.

EXAM-STYLE QUESTIONS

5 The mean height of children of a certain age is 136 cm. 12% of children have a height of 145 cm or more. Find the standard deviation of the heights.

7 The masses of cauliflowers are normally distributed with mean 0.85 kg. 74% of cauliflowers have mass less than 1.1 kg. Find:

a the standard deviation of cauliflowers' masses

b the percentage of cauliflowers with mass greater than 1 kg.

EXAM-STYLE QUESTIONS

10 It is suspected that the scores in a test are normally distributed. 30% of students score less than 108 marks on the test, and 20% score more than 154 marks.

a Find the mean and standard deviation of the scores, if they are normally distributed.

b 60% of students score more than 117 marks. Does this fact appear to be reasonably consistent with the idea that the scores are normally distributed as above?