

Z-Scores Questions Part 3

- 1 The IQs of students at school are normally distributed with a standard deviation of 15. If 20% of students have an IQ higher than 125, find the mean IQ of students at school.
- 2 The distances an athlete jumps are normally distributed with mean 5.2 m. If 15% of the jumps by this athlete are less than 5 m, what is the standard deviation?
- 3 The weekly income of a bakery is normally distributed with a mean of \$6100. If 85% of the time the weekly income exceeds \$6000, what is the standard deviation?
- 4 The arrival times of buses at a depot are normally distributed with standard deviation 5 minutes. If 10% of the buses arrive before 3:55 pm, find the mean arrival time of buses at the depot.
- 5
 - a Find the mean and standard deviation of a normally distributed random variable X , given that $P(X \geq 80) = 0.1$ and $P(X \leq 30) = 0.15$.
 - b In a Mathematics examination it was found that 10% of the students scored at least 80, and no more than 15% scored under 30. Assuming the scores are normally distributed, what proportion of students scored more than 50?
- 6 The diameters of pistons manufactured by a company are normally distributed. Only those pistons whose diameters lie between 3.994 cm and 4.006 cm are acceptable.
 - a Find the mean and the standard deviation of the distribution if 4% of the pistons are rejected as being too small, and 5% are rejected as being too large.
 - b Determine the probability that the diameter of a randomly chosen piston lies between 3.997 cm and 4.003 cm.
- 7 Circular metal tokens are used to operate a washing machine in a laundromat. The diameters of the tokens are normally distributed, and only tokens with diameters between 1.94 and 2.06 cm will operate the machine.
 - a Find the mean and standard deviation of the distribution given that 2% of the tokens are too small, and 3% are too large.
 - b Find the probability that at most one token out of a randomly selected sample of 20 will not operate the machine.



Answers

- 1** 112.4 **2** 0.193 m **3** \$96.50 **4** 4:01:24 pm
5 **a** $\mu \approx 52.4$, $\sigma \approx 21.6$ **b** $\mu \approx 52.4$, $\sigma \approx 21.6$, 54.4%
6 **a** $\mu \approx 4.00$ cm, $\sigma \approx 0.00353$ cm **b** 0.604
7 **a** $\mu = 2.00$ cm, $\sigma = 0.0305$ cm **b** 0.736