

Edexcel IAL S1 Normal Distribution Practice Exam

Pearson Edexcel International A Level Mathematics · 8 questions · 36 marks

Name _____

Date _____

Score / 36

- Answer every question. Show your working: most marks are for method.
- Calculator allowed.
- Topics: The normal distribution.
- The mark scheme is a separate free PDF: [alevelmathrevision.com/alevel-frontend/downloads/practice-exams/ial/edexcel-ial-s1-normal-distribution-practice-exam-mark-scheme.pdf](https://www.alevelmathrevision.com/alevel-frontend/downloads/practice-exams/ial/edexcel-ial-s1-normal-distribution-practice-exam-mark-scheme.pdf)

1. The random variable $X \sim N(30, 4^2)$. Find $P(X < 35)$. [2]
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2. The random variable $X \sim N(50, 8^2)$. Find $P(46 < X < 58)$. [3]
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3. The heights of adult men in a town are normally distributed with mean 175 cm and standard deviation 6 cm. Find the proportion of men who are taller than 185 cm. [3]
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4. The IQ scores of a population are modelled by $N(100, 15^2)$. Find the upper quartile and the interquartile range of the scores. [4]
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5. The diameters of bolts made by a machine are normally distributed with mean 12 mm and standard deviation 0.2 mm. A bolt is rejected if its diameter is less than 11.7 mm or more than 12.3 mm. Find the expected number of rejected bolts in a batch of 1000. [4]
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6. The random variable $X \sim N(40, \sigma^2)$ and $P(X > 45) = 0.3$. [5]
(a) Find the value of σ . (3)
(b) Hence find $P(X < 30)$. (2)
7. The lengths of a species of fish are normally distributed with mean μ cm and standard deviation σ cm. [6]
10% of the fish are longer than 80 cm and 20% are shorter than 60 cm. Find the values of μ and σ .
8. A machine fills bags of flour. The mass of flour in a bag is normally distributed with standard deviation 4 g. The machine is first set so that the mean mass is 502 g. [9]
(a) Find the probability that a bag contains less than 500 g. (2)
(b) The mean is changed so that only 1% of bags contain less than 500 g. Find the new mean, to one decimal place. (3)
(c) With the new setting, three bags are chosen at random. Find the probability that all three contain at least 500 g. (2)
(d) Using a mean of 509.3 g, find the probability that a bag contains more than 515 g. (2)

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