A-Level Starter Activity

Jahwa Maths

Topic: Coding

Chapter Reference: Statistics 1, Chapter 2

6 minutes

1. A company manager is investigating the time taken, t minutes, to complete an aptitude test. The human resources manager produced the table below of coded times, x minutes, for a random sample of 30 applicants.

Coded time (x minutes)	Frequency (f)	Coded time midpoint (y minutes)
$0 \leq x < 5$	3	2.5
$5 \leq x < 10$	15	7.5
$10 \leq x < 15$	2	12.5
$15 \leq x < 25$	9	20
$25 \leq x < 35$	1	30

a. Use linear interpolation to estimate the median of the coded times. **(3)**

b. Estimate the standard deviation of the coded times. **(4)**

The company manager is told by the human resources manager that he subtracted 15 from each of the times and then divided by 2, to calculate the coded times.

c. Calculate an estimate for the median and the standard deviation of t. **(4)**

Solutions

1a.

Median lies in the group $5 \leq x < 10$	**M1**
$Q_2 = 5 + \frac{12}{15} \times 5$	**M1**
$Q_2 = 9.166$	**M1**

1b.

Mean $= \frac{3 \times 2.5 + 15 \times 7.5 + 2 \times 12.5 + 9 \times 20 + 1 \times 30}{30}$	**M1**
Mean $= \frac{355}{30}$	**M1**
$\sigma^2 = \frac{5675}{30} - (\frac{355}{30})^2$	**M1**
$\sigma = 7.01$	**M1**

1c.

Q_2 for t = 2 x 9 + 15	**M1**
t = 33	**M1**
σ for t = 2 x 7.01	**M1**
$\sigma = 14.02$	**M1**