

3 A machine produces bolts for ceiling fans.
 The machine is set to produce bolts of length 26 mm.
 For a bolt to be usable, its length must be (26 ± 2) mm.

A sample of 100 bolts was taken.
 The bolts were measured and the results summarised in the table below

Length of bolt (b mm)	Midpoint (x mm)	Frequency
$21 < b \leq 22$	21.5	1
$22 < b \leq 23$	22.5	5
$23 < b \leq 24$	23.5	8
$24 < b \leq 25$	24.5	15
$25 < b \leq 26$	25.5	31
$26 < b \leq 27$	26.5	24
$27 < b \leq 28$	27.5	12
$28 < b \leq 29$	28.5	4

- (a) Estimate the proportion of bolts in this sample that are usable.

(1)
- (b) Use linear interpolation to find an estimate for the median bolt length.

(2)
- Given that $\sum x = 2560$ $\sum x^2 = 65\,751$
- (c) find an estimate for

(i) the mean bolt length,

(ii) the standard deviation of the bolt lengths.

(3)