

1. (a) (i) median = 104 grams A1
Note: Accept 105.

- (ii) 30th percentile = 90 grams A1

- (b) $80 - 49$ (M1)
 $= 31$ A1

Note: Accept answers 30 to 32.

[4]

2. (a) (i) the median height is 1.18 A1

- (ii) the interquartile range is UQ – LQ
 $= 1.22 - 1.13 = 0.09$ (accept answers that round to 0.09) A1A1

Note: Award A1 for the quartiles, A1 for final answer.

- (b) (i)

$1.00 < h \leq 1.05$	$1.05 < h \leq 1.10$	$1.10 < h \leq 1.15$	$1.15 < h \leq 1.20$	$1.20 < h \leq 1.25$	$1.25 < h \leq 1.30$
5	9	13	24	19	10

A1A1

Note: Award A1 for entries within ± 1 of the above values and A1 for a total of 80.

- (ii) unbiased estimate of the population mean

$$\left(\frac{5 \times 1.025 + 9 \times 1.075 + 13 \times 1.125 + 24 \times 1.175 + 19 \times 1.225 + 10 \times 1.275}{80} \right) = 1.17$$
 A1

unbiased estimate of the population variance

use of $s_{n-1}^2 = \left(\frac{n}{n-1} \right) s_n^2$ or GDC (M1)

obtain 0.00470 A1

- (c) (i) $P(h \leq 1.15 \text{ m}) = \frac{27}{80}$ (0.3375 or 0.338) (allow $\frac{26}{80}$ (0.325)) A1

(ii) use of the conditional probability formula $P(A | B) = P(A \cap B) / P(B)$ (M1)

obtain $\frac{18}{80} \div \frac{27}{80}$ (A1)(A1)

$= \frac{2}{3}$ (0.667) (allow $\frac{18}{26}$ (0.692)) A1

[13]

3. (a) 64 A1

(b) (i) 90 percentile = 87 minimum mark = 87 (accept 88) (M1)A1

(ii) 70 percentile = 74 minimum mark = 74 (accept 73) (M1)A1

[5]

4. (a) Median = 50 (allow 49 or 51) A1

(b) Interquartile range = $60 - 40 = 20$ (allow 59, 61, 39, 41 and corresponding difference) A1A1 N1

Note: Award A1 for correct quartiles, A1 for difference.

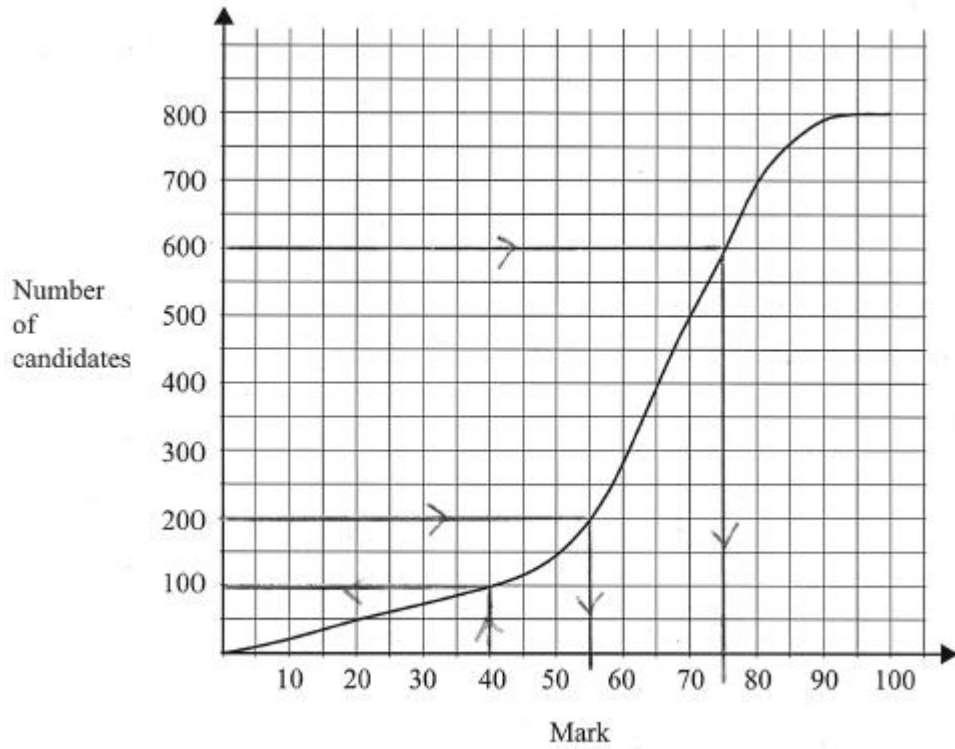
(c)

Time to complete puzzle in seconds	Number of applicants
$20 < t \leq 30$	10
$30 < t \leq 35$	6
$35 < t \leq 40$	9
$40 < t \leq 45$	11
$45 < t \leq 50$	14
$50 < t \leq 60$	25
$60 < t \leq 80$	25

Notes: Allow ± 1 on each entry provided total adds up to 100. M1A1

[5]

5. (a)



Lines on graph
100 students score 40 marks or fewer.

(M1)
A1 N2

(b) Identifying 200 **and** 600
Lines on graph.
 $a = 55, b = 75$

A1
(M1)
A1A1N1N1

[6]