

- 1.) (a) correct end points (A1)(A1)  
 max = 27, min = 4  
 range = 23 A1 N33  
 (b) Graph 3 A2 N22

[5]

- 2.) (a)  $\Sigma fx = 1(2) + 2(4) + \dots + 7(4)$ ,  $\Sigma fx = 146 + 5x$  (seen anywhere) A1  
 evidence of substituting into mean =  $\frac{\Sigma fx}{\Sigma f}$  (M1)

correct equation A1

$$e.g. \frac{146 + 5x}{34 + x} = 4.5, 146 + 5x = 4.5(34 + x)$$

$$x = 14 \quad A1N2$$

- (b)  $\sigma = 1.54$  A2N2

[6]

- 3.) (a) (i) evidence of appropriate approach (M1)  
 $e.g. 9 + 25 + 35, 34 + 35$   
 $p = 69$  A1 N2

(ii) evidence of valid approach (M1)

$$e.g. 109 - \text{their value of } p, 120 - (9 + 25 + 35 + 11)$$

$$q = 40 \quad A1N2$$

- (b) evidence of appropriate approach (M1)

$$e.g. \text{substituting into } \frac{\Sigma fx}{n}, \text{ division by } 120$$

$$\text{mean} = 3.16 \quad A1N2$$

- (c) 1.09 A1N1

[7]

- 4.) (a)  $\sigma = 1.61$  A2 N2  
 (b) median = 4.5 A1N1  
 (c)  $Q_1 = 3, Q_3 = 5$  (may be seen in a box plot) (A1)(A1)  
 IQR = 2 (accept any notation that suggests the interval 3 to 5) A1N3

[6]

- 5.) (a) evidence of using mid-interval values (5, 15, 25, 35, 50, 67.5, 87.5) (M1)  
 $\sigma = 19.8$  (cm) A2 N3

- (b) (i)  $Q_1 = 15, Q_3 = 40$  (A1)(A1)  
 $IQR = 25$  (accept any notation that suggests the interval 15 to 40) A1 N3

(ii) **METHOD 1**

60 % have a length less than  $k$  (A1)  
 $0.6 \times 200 = 120$  (A1)  
 $k = 30$  (cm) A1N2

### METHOD 2

$0.4 \times 200 = 80$  (A1)  
 $200 - 80 = 120$  (A1)  
 $k = 30$  (cm) A1N2

(c)  $l < 20 \text{ cm} \Rightarrow 70$  fish (M1)  
 $P(\text{small}) = \frac{70}{200} (= 0.35)$  A1N2

(d)

<b>Cost \$X</b>	4	10	12
<b>P(X = x)</b>	<b>0.35</b>	0.565	<b>0.085</b>

A1A1N2

(e) correct substitution (of their  $p$  values) into formula for  $E(X)$  (A1)  
*e.g.*  $4 \times 0.35 + 10 \times 0.565 + 12 \times 0.085$   
 $E(X) = 8.07$  (accept \$8.07) A1N2

[15]

6.) (a) 18 A1 N1

(b) (i) 10 A2 N2  
(ii) 44 A2N2

[5]

7.) (a) evidence of using  $\sum f_i = 100$  (M1)

$k = 4$  A1 N2

(b) (i) evidence of median position (M1)

*e.g.* 50<sup>th</sup> item,  $26 + 10 + 20 = 56$

median = 3 A1 N2

(ii)  $Q_1 =$  and  $Q_3 = 5$  (A1)(A1)

interquartile range = 4 (accept 1 to 5 or 5-1, *etc.*) A1 N3

[7]

8.) (a) (i)  $p = 65$  A1 N1

(ii) for evidence of using sum is 125 (or  $99 - p$ ) (M1)

$q = 34$  A1 N2

(b) evidence of median position (M1)

*e.g.* 63<sup>rd</sup> student,  $\frac{125}{2}$

median is 17 (sit-ups) A1 N2

- (c) evidence of substituting into  $\frac{\sum f(x)}{125}$  (M1)

e.g.  $\frac{15(11)+16(21)+17(33)+18(34)+19(18)+20(8)}{125}, \frac{2176}{125}$

mean = 17.4

A1 N2

[7]

- 9.) (a) median  $m = 32$  A1 N1

- (b) lower quartile  $Q_1 = 22$ , upper quartile  $Q_3 = 40$   
interquartile range = 18

(A1)(A1)

A1 N3

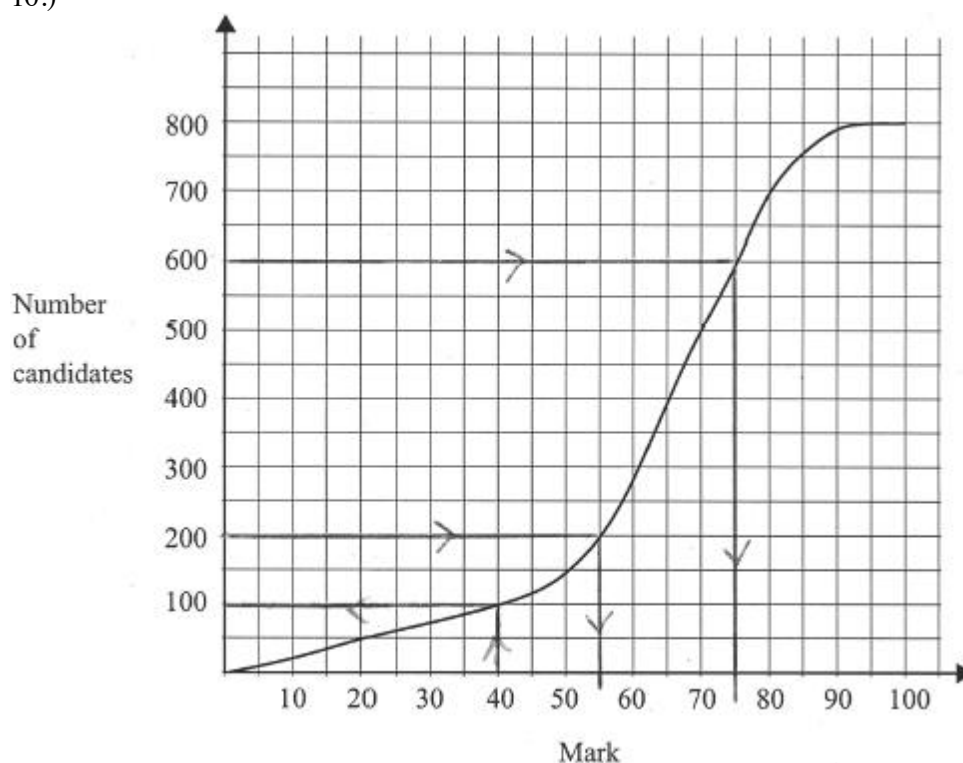
- (c)

Time (minutes)	Number of students
$0 \leq t < 10$	5
$10 \leq t < 20$	<b>11</b>
$20 \leq t < 30$	20
$30 \leq t < 40$	24
$40 \leq t < 50$	<b>14</b>
$50 \leq t < 60$	6

A1A1 N2

[6]

10.)



- (a) Lines on graph  
100 students score 40 marks or fewer.

(M1)

A1N2

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

A1  
(M1)  
A1A1N1N1

[6]

- 11.) (a) (i)  $m = 165$  A1 N1

(ii) Lower quartile (1<sup>st</sup> quarter) = 160

(A1)

Upper quartile (3<sup>rd</sup> quarter) = 170

(A1)

IQR = 10

A1 N3

- (b) Recognize the need to use the 40<sup>th</sup> percentile, or 48<sup>th</sup> student  
*eg* a horizontal line through (0, 48)  
 $a = 163$

(M1)

A1 N2

[6]

- 12.) (a)  $A = 18, B = 19, C = 23, D = 31, E = 36$  A1A1A1A1A1 N5

- (b) IQR = 12

A1 N1

[6]

- 13.) (a) Correct mid interval values 14, 23, 32, 41, 50 (A1)

Substituting into  $\frac{\sum f w}{\sum f}$

M1

$$\text{eg } \bar{w} = \frac{7(14) + 12(23) + 13(32) + 10(41) + 8(50)}{50}$$

$$\bar{w} = \frac{1600}{50}$$

A1

$$\bar{w} = 32 \text{ (kg)}$$

AG N0

- (b) **METHOD 1**

Total weight of other boxes =  $1600 - 50x$

(A1)

Total number of other boxes =  $50 - x$

(A1)

Setting up **their** equation

M1

$$\text{eg } \frac{1600 - 50x}{50 - x} = 30, 1600 - 50x = 1500 - 30x$$

$$x = 5$$

A1 N3

**METHOD 2**

Let  $z$  be the number of other boxes in Class E (accept any symbol in the working, even including  $x$ ).

Total weight of other boxes =  $1200 + 50z$

(A1)

Total number of other boxes =  $42 + z$

(A1)

Setting up **their** equation

M1

$$\text{eg } \frac{1200-50z}{42+z} = 30, 1200 + 50z = 1260 + 30z$$

$$z = 3$$

$$x = 5$$

A1 N3

(c) Setting up their inequality

M1

Correct substitution

A1

$$\text{eg } \frac{98+276+416+41(10+y)+400}{50+y} < 33, \frac{1600-41y}{50+y} < 33$$

$$1600 + 41y < 1650 + 33y$$

(A1)

$$8y < 50 \text{ (} y < 6.25 \text{)}$$

A1

6

A1 N1

***Note:** If candidates don't use the mid-interval values, but assume that all the new boxes weigh the minimum amount for Class D, award marks as follows:*

Setting up **their** inequality

M1

Correct substitution

A1

$$\text{eg } \frac{1600-36.5y}{50+y} < 33$$

$$1600 + 36.5y < 1650 + 33y$$

(A1)

$$3.5y < 50 \text{ (} y < 14.28 \dots \text{)}$$

A1

14

A1 N1

[12]

14.) (a)

Age range	Frequency	Mid - interval value
$0 \leq \text{age} < 20$	40	10
$20 \leq \text{age} < 40$	<b>70</b>	<b>30</b>
$40 \leq \text{age} < 60$	<b>100</b>	<b>50</b>
$60 \leq \text{age} < 80$	<b>50</b>	<b>70</b>
$80 \leq \text{age} \leq 100$	<b>10</b>	<b>90</b>

A1A1 N2

(b) For attempting to find  $\sum f x$

(M1)

Correct substitution

(A1)

$$\text{eg } 40 \times 10 + \dots + 10 \times 90 = 11900$$

For dividing by 270

(M1)

$$\text{eg } \frac{11900}{270}$$

$$\text{Mean} = 44.1$$

A1 N4

[6]

- 15.)  $b = 3, c = 3$  A1A1 N2  
 using mean  $\left(\frac{a+b+c+d}{4} = 4\right)$  M1  
 using range ( $d - a = 6$ ) M1  
 $a = 2, d = 8$  A1A1 N2 [6]
- 16.) (a) (i)  $r = 10$  A2 N2  
 (ii)  $s = 13$  A2 N2  
 (b) Using  $\frac{\sum x}{12} = 10$  A1  
 $t = 18$  A1 N1 [6]
- 17.) (a) D B C A1A1A1 N3  
 (b) B A C A1A1A1 N3 [6]
- 18.) (a) 3 A1 N1  
 (b) 6 A2 N2  
 (c) Recognizing the link between 6 and the upper quartile (M1)  
*eg 25% scored greater than 6,*  
 $0.25 \times 32$  (A1)  
 8 A1 N3 [6]
- 19.) (a) (i) 50 (accept 49, “fewer than 50”) A1 N1  
 (ii) Cumulative frequency (7) = 90 (A1)  
 $90 - 50$  (M1)  
 $= 40$  A1 N2  
 (iii) 75th or 75.5th person A1  
 median = 6.25 (min), 6 min 15 secs A1 N1  
 (b) Evidence of finding 40% (60%) of 150 M1  
 Number spending less than  $k$  minutes is  $(150 - 60) = 90$  (A1)  
 $k = 7$  A1 N2  
 (c) (i)

$t$ (minutes)	$0 \leq t < 2$	$2 \leq t < 4$	$4 \leq t < 6$	$6 \leq t < 8$	$8 \leq t < 10$	$10 \leq t < 12$
Frequency	10	23	37	38	27	15

A1A1A1 N3

- (ii) Evidence of using **all** correct mid-interval values (1, 3, 5, 7, 9, 11) A1

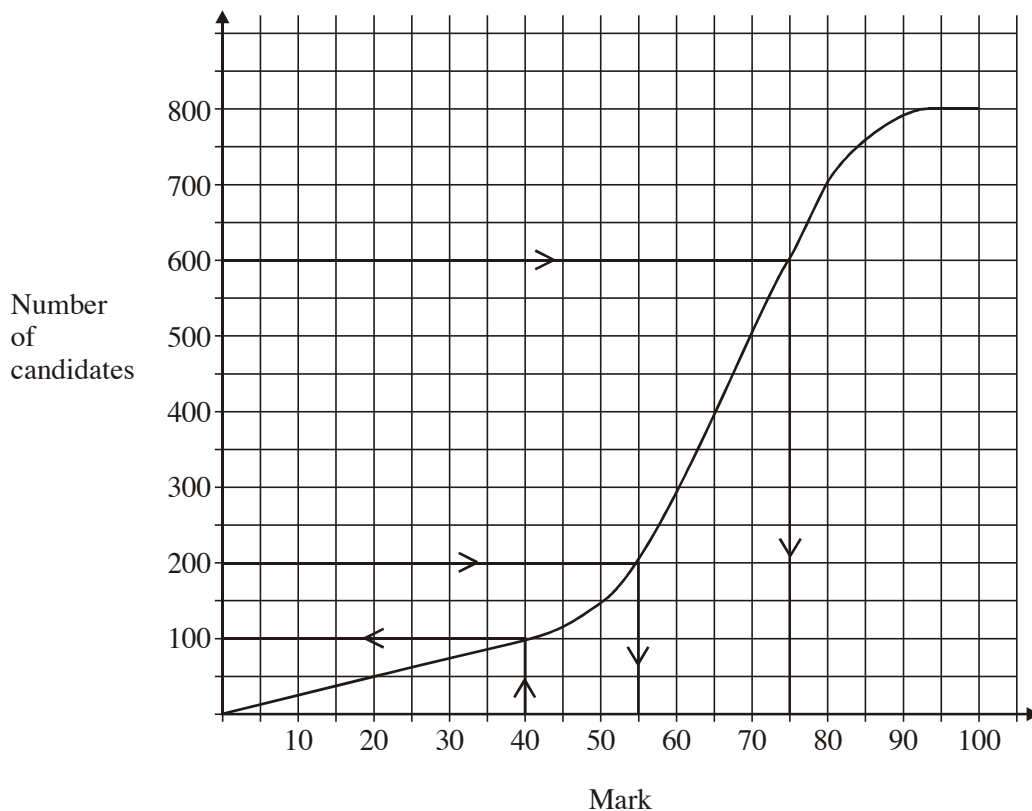
$$\text{mean} = \left( \frac{1 \times 10 + 3 \times 23 + 5 \times 37 + 7 \times 38 + 9 \times 27 + 11 \times 15}{150} \right)$$

$$= 6.25 \text{ (min), 6 min 15 secs}$$

A1 N1

[14]

20.)



- (a) Lines on graph (M1)  
100 students score 40 marks or fewer. A1 2
- (b) Identifying 200 and 600 (A1)  
Lines on graph. (M1)  
 $a = 55, b = 75$ . A1A1 4

[6]

21.) (a)  $\text{mean} = \sum \frac{x}{n} \left( = \frac{2230}{45} \right)$  (M1)

$\bar{x} = 49.6$  (Accept 50) (A1) (C2)

(b)  $\bar{y} = \frac{\sum y}{n+2}$  (may be implied) (M1)

$\sum y = 2230 + 37 + 30$  (A1)

$$\bar{y} = \frac{2297}{47} \quad (\text{A1})$$

$$= 48.9 \text{ (Accept 49)} \quad (\text{A1}) \quad (\text{C4})$$

[6]

22.) (a) Mean =  $\frac{\sum f x}{\sum f}$

$$\sum f x = (1)(0) + (2)(4) + (3)(6) + (4)(k) + (5)(8) + (6)(6) + (7)(6) \quad (\text{A1})$$

$$\sum f k + 30 \quad (\text{A1})$$

$$\text{Using mean } 4.6 = \frac{144 + 4k}{k + 30} \quad (\text{M1})$$

$$4.6k + 138 = 144 + 4k \quad (\text{A1})$$

$$0.6k = 6$$

$$k = 10 \quad (\text{A1})(\text{C5})$$

(b) Mode = 4 (A1) (C1)

(accept 5, if  $k < 8$ )

[6]

23.) (a) 76 (mice) (A1) (N1)

(b) 11.2 (seconds) (A1) (N1)

(c) (i)  $p = 76 - (16 + 22) = 38$  (allow **ft** from (ii) (a)) (A1) (N1)

$$q = 132 - 76 = 56 \quad (\text{A1}) \quad (\text{N1})$$

(ii)  $x = \frac{7.5 \times 16 + \dots 14.5 \times 23}{16 + \dots 23} \quad \left( = \frac{3363}{300} \right) \quad (\text{M1})$

$$= 11.2 \text{ (accept 11.21)} \quad (\text{A1}) \quad (\text{N2})$$

[6]

24.) (a)

Mark ( $x$ )	$0 \leq x < 20$	$20 \leq x < 40$	$40 \leq x < 60$	$60 \leq x < 80$	$80 \leq x < 100$
Number of Students	22	<b>50</b> ( $\pm 1$ )	<b>66</b> ( $\pm 1$ )	<b>42</b> ( $\pm 1$ )	20

(A1)(A1)(A1) (C3)

(b) 40th Percentile  $\Rightarrow$  80th student fails, (mark 42%) (M2)

Pass mark 43% (Accept mark  $> 42$ .) (A1) (C3)



[6]

25.) List of frequencies with  $p$  in the middle

eg  $5 + 10, p, 6 + 2 \Rightarrow 15, 8$ , or  $15 < \frac{23+p}{2}$ , or  $p > 7$ . (M1)

Consideration that  $p < 10$  because 2 is the mode or discretionary for further processing. (M1)

Possible values of  $p$  are 8 and 9

(A2)(A2) (C6)

[6]

26.) (a) line(s) on graph (M1)

median is 183 (A1) (C2)

(b) Lower quartile  $Q_1 = 175$

(A1)

Upper quartile  $Q_3 = 189$

(A1)

IQR is 14

(Accept  $189 - 175$ ,  $175$  to  $189$ ,  $189$  to  $175$  and  $175 - 189$ )

(M1)(A1) (C4)

[6]

27.)  $d = 11$ ;  $c = 11$  (A1)(A1) (C1)(C1)

$d - a = 8$  (or  $11 - a = 8$ )

(A1)

$a = 3$

(A1) (C2)

$$\frac{3+b+11+11}{4} = 8 \left( \text{or } \frac{\text{sum}}{4} = 8 \right)$$

(A1)

$b = 7$

(A1) (C2)

[6]

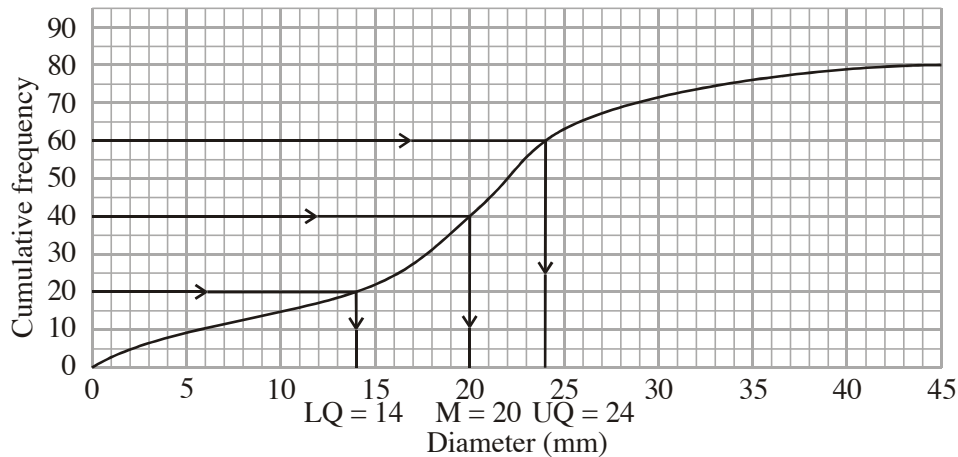
28.)

$x$	$f$	$\Sigma f$
4	2	2
5	5	7
6	4	11
7	3	14
8	4	18
10	2	20
12	1	21

- (a)  $m = 6$  (A2) (C2)
- (b)  $Q_1 = 5$  (A2) (C2)
- (c)  $Q_3 = 8$  (A1)
- $IQR = 8 - 5$  (M1)
- $= 3$  (accept  $5 - 8$  or  $[5, 8]$ ) (C2)

[6]

29.)



- (a) (i) Correct lines drawn on graph, (A1)(C1)
- median = 20 (A1)(C1)
- (ii) Correct lines drawn on graph, (A1)(C1)
- $UQ = Q_3 = 24$  (A1)(C1)
- (b)  $IQR = Q_3 - Q_1$  (or  $UQ - LQ$ ) (M1)
- $= 10$  (accept 14 to 24) (A1) (C2)
- Note: Accept 14 to 24, 24 to 14, 14 - 24 or 24 - 14.*

[6]

30.) Jan–Sept  $\Sigma = 630 \times 9 = 5670$  (M1)(A1)

Oct–Dec  $\Sigma = 810 \times 3 = 2430$  (M1)(A1)

$$\bar{x} = \frac{5670 + 2430}{12} \quad (M1)$$

mean = 675 (A1) (C6)

[6]

- 31.) (a) (i) median fare = \$24 ( $\pm 0.5$ ) (A1)
- (ii) fare  $\leq \$35 \Rightarrow$  number of cabs is 154 (or 153) (A1) 2
- (b) 40% of cabs = 80 cabs (A1)
- fares up to \$22 (A1)
- distance =  $\$22 \div \$0.55$  (M1)
- $a = 40$  km (A1) 4
- (c) Distance 90 km  $\Rightarrow$  fare =  $90 \times \$0.55$
- $= \$49.50$  (A1)

$$\text{Fare } \$49.50 \Rightarrow \text{number of cabs} = \frac{200 - 186}{14}$$

(M1)

(A1)

$$\text{Thus percentage is } \frac{14}{200} = 7\%$$

(A1)

4

[10]

$$32.) \quad \text{Median} = \text{middle value} \Rightarrow b = 11 \quad (\text{A1})$$

$$\text{Mean} = \frac{a + b + c}{3} = \frac{a + 11 + c}{3} = 9 \Rightarrow a + 11 + c = 27 \quad (\text{M1})$$

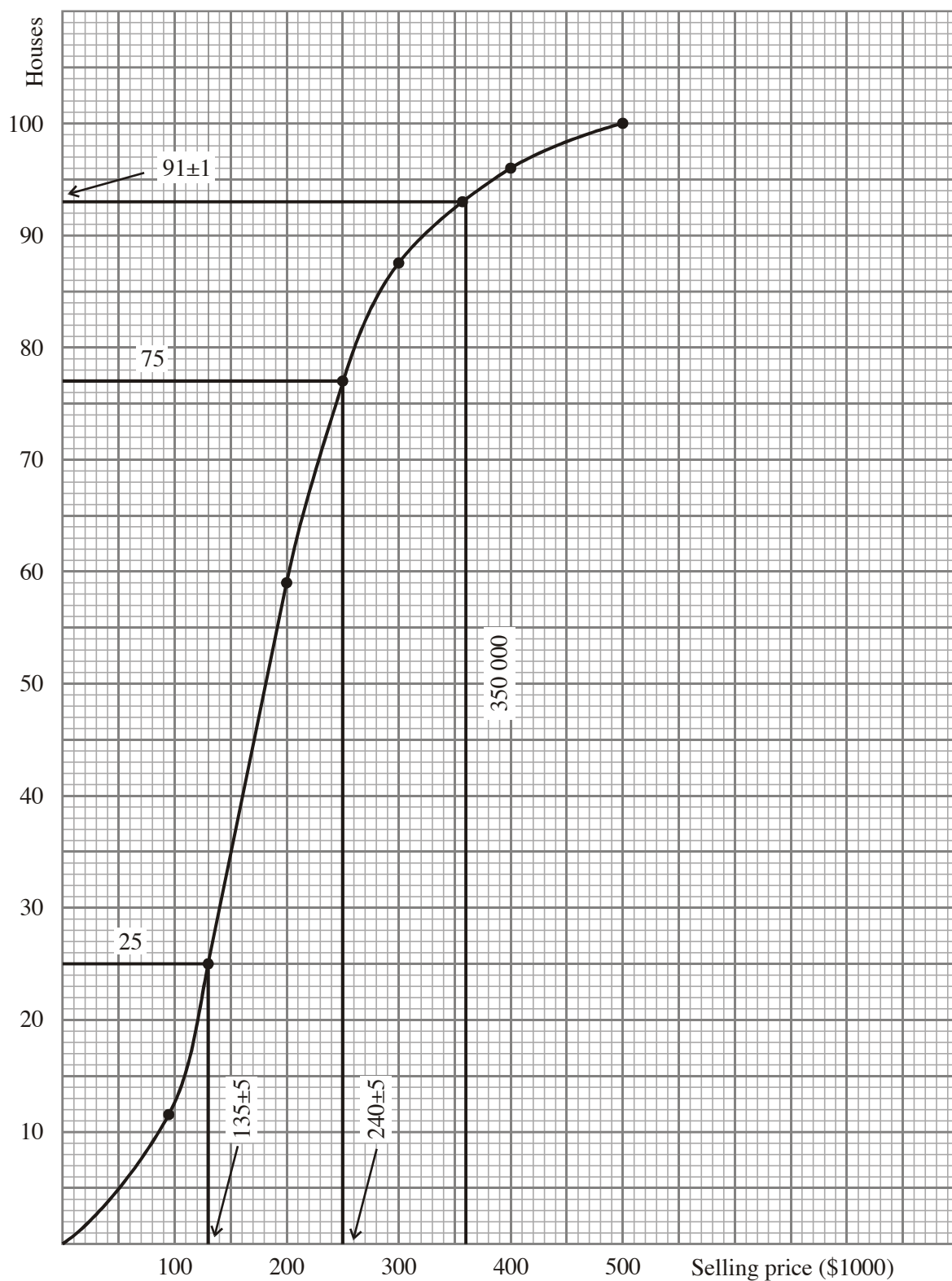
$$\Rightarrow a + c = 16 \quad (\text{A1})$$

$$\text{Range} = c - a = 10 \quad (\text{M1})(\text{A1})$$

$$\text{Solving equations simultaneously gives } a = 3 \quad (\text{A1}) \quad (\text{C6})$$

[6]

$$33.) \quad (a)$$



(A1)(A2)(A1) 4

**Notes:** Award (A1) for correct axes, scales and labelling, (A1) for correctly plotted points.

Award (A2) for good curve correctly drawn, (A1) for badly drawn, correct curve.

Award (A1) for a correct polygon.

(b)  $Q_1 = 135 \pm 5$   $Q_3 = 240 \pm 5$  (M1)(A1)

Interquartile range =  $105 \pm 10$ . (Accept  $135 - 240$  or  $240 - 135$ .) (A1) 3

**Note:** Award (M1) for the correct lines on the graph.

- (c)  $a = 94 - 87 = 7$ ,  $b = 100 - 94 = 6$  (A1)(A1) 2
- (d)  $\text{mean} = \frac{12(50) + 46(150) + 29(250) + 7(350) + 6(450)}{100}$  (M1)  
 $= 199$  or \$199000 (A1)  
 OR  
 $\text{mean} = 199$  or \$199000 (G2) 2
- (e) (i) \$350000  $\Rightarrow$  91.5  
 Number of *De luxe* houses  $\approx 100 - 91.5$  (M1)  
 $= 9$  or 8 (A1)
- (ii)  $P(\text{both} > 400000) = \frac{6}{9} \left( \frac{5}{8} \right) = \frac{5}{12}$  or  $\frac{6}{8} \left( \frac{5}{7} \right) = \frac{15}{28}$  (M1)(A1) 4

**Note:** Award (M1)(A0) for the answers  $\frac{4}{9}$  or  $\frac{9}{16}$  obtained from correct independent probabilities.

[15]

- 34.) (a) Median = middle number of 75 (M1)  
 $= 38\text{th number}$   
 $= 4$  (A1) (C2)

- (b)  $\text{Mean} = \frac{5 + 18 + 48 + 72 + 100 + 42}{75}$  (M1)  
 $= \frac{285}{75}$   
 $= 3.8$  (A1) (C2)

[4]

- 35.) (a)  $s = 7.41(3 \text{ sf})$  (G3) 3

(b)

Weight (W)	$W \leq 85$	$W \leq 90$	$W \leq 95$	$W \leq 100$	$W \leq 105$	$W \leq 110$	$W \leq 115$
Number of packets	5	15	<b>30</b>	<b>56</b>	<b>69</b>	<b>76</b>	80

(A1) 1

- (c) (i) From the graph, the median is approximately 96.8.  
 Answer: 97 (nearest gram). (A2)
- (ii) From the graph, the upper or third quartile is approximately 101.2.  
 Answer: 101 (nearest gram). (A2) 4

- (d) Sum = 0, since the sum of the deviations from the mean is zero. (A2)  
**OR**

$$\sum (W_i - \bar{W}) = \sum W_i - \left( 80 \frac{\sum W_i}{80} \right) = 0 \quad (\text{M1})(\text{A1}) \quad 2$$

- (e) Let  $A$  be the event:  $W > 100$ , and  $B$  the event:  $85 < W \leq 110$

$$P(A|B) = \frac{P(A \cap B)}{P(B)} \quad (\text{M1})$$

$$P(A \cap B) = \frac{20}{80} \quad (\text{A1})$$

$$P(B) = \frac{71}{80} \quad (\text{A1})$$

$$P(A|B) = 0.282 \quad (\text{A1})$$

**OR**

71 packets with weight  $85 < W \leq 110$ . (M1)

Of these, 20 packets have weight  $W > 100$ . (M1)

$$\text{Required probability} = \frac{20}{71} \quad (\text{A1})$$

$$= 0.282 \quad (\text{A1}) \quad 4$$

*Notes: Award (A2) for a correct final answer with no reasoning.*

*Award up to (M2) for correct reasoning or method.*

**[14]**

36.) (a) (Using mid-intervals)

$$\bar{v} = \frac{65(7) + 75(25) + \dots + 135(5)}{7 + 25 + \dots + 5} \quad (\text{M1})$$

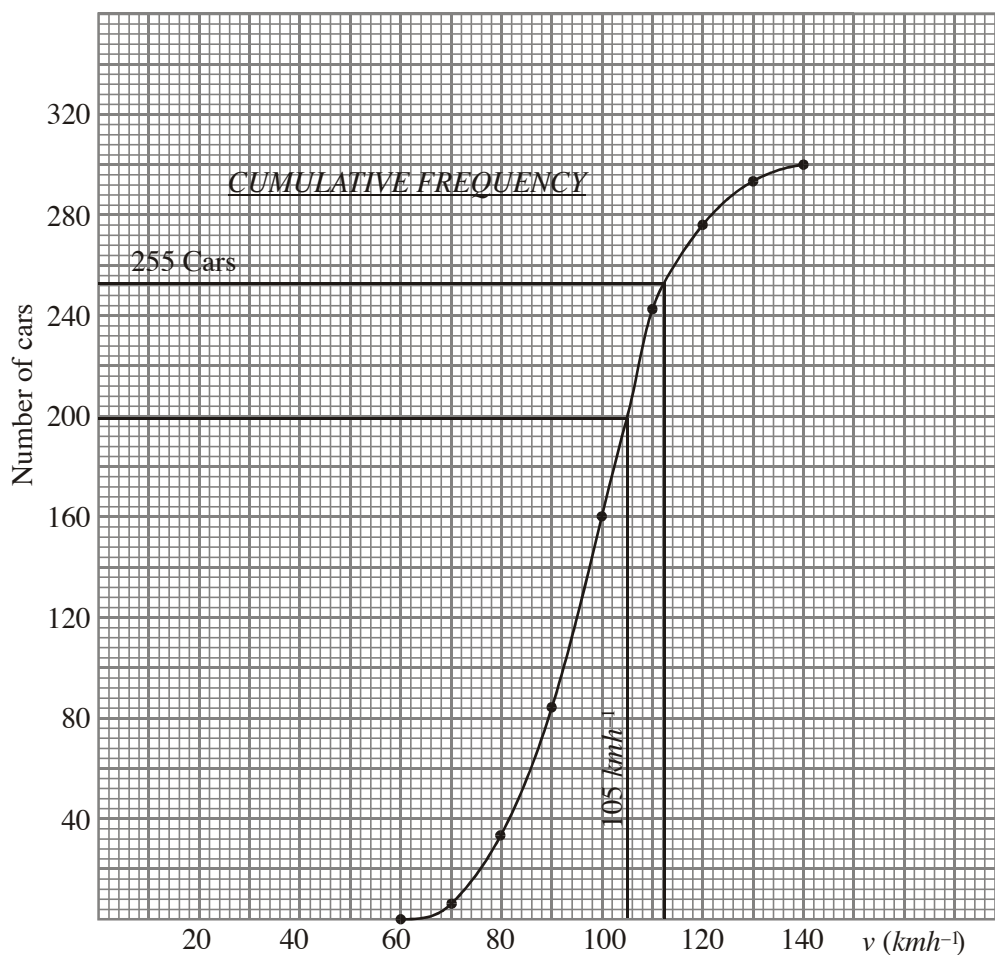
$$= \frac{29450}{300} = 98.2 \text{ km h}^{-1} \quad (\text{A1})$$

**OR**

$$\bar{v} = 98.2 \quad (\text{G2}) \quad 2$$

(b) (i)  $a = 165, b = 275$  (A1)

(ii)



(A4) 5

*Note:* Award (A1) for properly marked scales and axes,  
(A2) for 9 correctly plotted points, (A1) for 7 or 8 points,  
(A1) for a smooth curve through the points.

- (c) (i) Vertical line on graph at  $105 \text{ km h}^{-1}$  (M1)

$$\frac{300 - 200}{300} \times 100\% = 33.3(\pm 1.3\%) \quad (\text{A1})$$

**OR**

$$33.3(\pm 1.3\%) \quad (\text{A2})$$

- (ii)  $15\% \text{ of } 300 = 45 \quad 300 - 45 = 255$

Horizontal line on graph at 255 cars (M1)

Speed =  $114(\pm 2 \text{ km h}^{-1})$  (A1)

**OR**

$$\text{Speed} = 114(\pm 2 \text{ km h}^{-1}) \quad (\text{A2}) \quad 4$$

[11]

37.) (a) (i) 10 (A1)

(ii)  $14 + 10 = 24$

(A1) 2

(b)

	$x_i$	$f_i$	
(A1)	15	1	(A1)
	25	5	
	35	7	
	45	9	
	55	10	
	65	16	
	75	14	
	85	10	
	95	8	
		80	(AG)

**Note:** Award (A0) for using the mid-interval values of 14.5, 24.5 etc.

(i)  $\square = 63$

(A1)

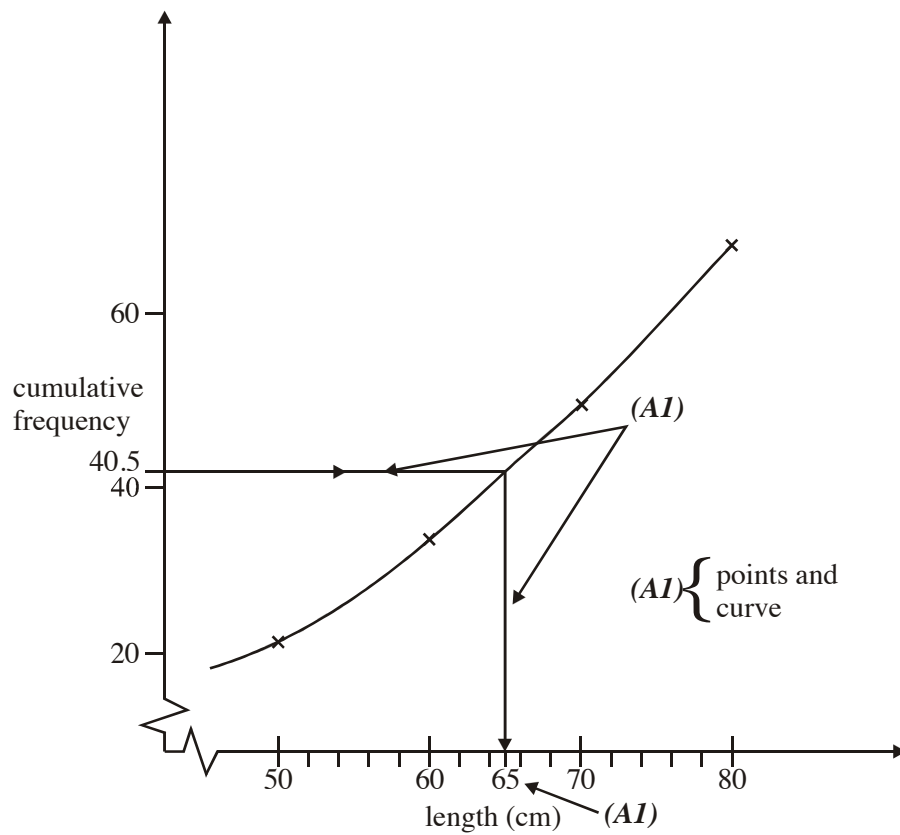
(ii)  $\square = 20.5$  (3 sf)

(A1) 4

(c) Assymetric diagram/distribution

(A1) 1

(d)



3

**OR** Median = 65

(A3)

3

**Note:** This answer assumes appropriate use of a calculator with correct arguments.

**OR** Linear interpolation on the table:

(M1)



$$\left(\frac{48-40.5}{48-32}\right) \times 60 + \left(\frac{40.5-32}{48-32}\right) \times 70 = 65 \text{ (2sf)} \quad (\text{A1})(\text{A1}) \quad 3$$

[10]

38.) (a)  $\bar{x} = \$59$  (G2)

OR

$$\bar{x} = \frac{10 \times 24 + 30 \times 16 + \dots + 110 \times 10 + 130 \times 4}{24 + 16 + \dots + 10 + 4} \quad (\text{M1})$$

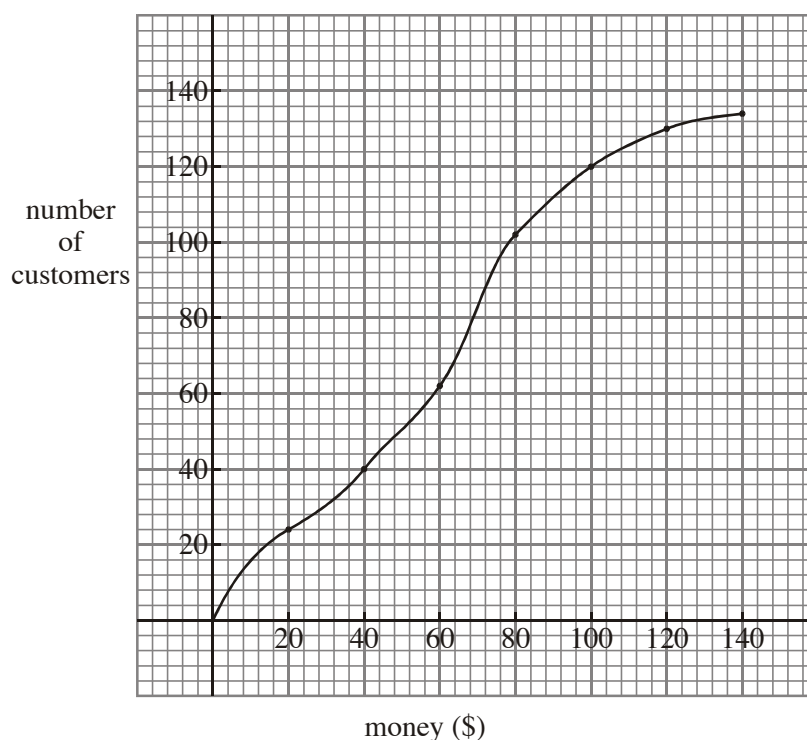
$$= \frac{7860}{134}$$

$$= \$59 \quad (\text{A1}) \quad 2$$

(b)

Money (\$)	<20	<40	<60	<80	<100	<120	<140
Customers	24	40	<b>62</b>	<b>102</b>	<b>120</b>	<b>130</b>	<b>134</b>

(A1)



(A4) 5

**Note:** Award (A1) for the correct scale, (A1) for the points, and (A2) for the curve.

(c) (i)  $t = 2d^{2/3} + 3$   
Mean  $d = 59$  (M1)

Mean  $t \approx 2 \times (59)^{2/3} + 3$  (M1)

$\approx 33.3 \text{ min. (3 sf) (accept 33.2)}$  (A1)

(ii)  $t > 37 \Rightarrow 2d^{2/3} + 3 > 37$  (M1)

$$2d^{2/3} > 34$$

$$d^{2/3} > 17 \quad (\text{A1})$$

$$d > (17)^{3/2}$$

$$d > 70.1$$

From the graph, when  $d = 70.1$ ,  $n = 82$  (A1)

number of shoppers =  $134 - 82$  (A1)

= 52

(A1) 8

[15]

39.) 
$$\frac{(10 \times 1) + (20 \times 2) + (30 \times 5) + (40 \times k) + (50 \times 3)}{k + 11} = 34 \quad (\text{M1})(\text{A1})$$

$$\frac{40k + 350}{k + 11} = 34 (\text{A1})$$

$$\Rightarrow k = 4 \quad (\text{A1}) \quad (\text{C4})$$

[4]

40.) (a)

$x$	15	45	75	105	135	165	195	225
$f$	5	15	33	21	11	7	5	3

(M1)

$$\bar{x} = 97.2 \text{ (exactly)}$$

(A1) 2

(b)

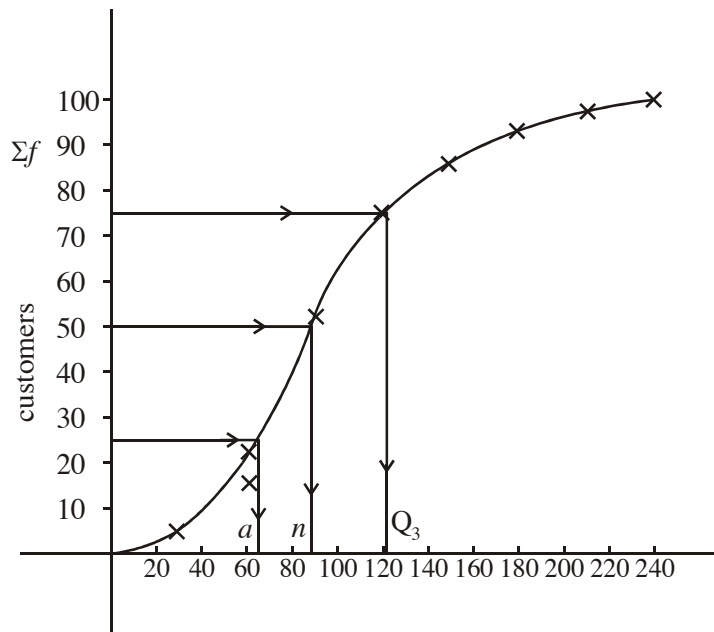
$x$	30	60	90	120	150	180	210	240
$\Sigma f$	5	20	53	74	85	92	97	100

(A1)

1

*Note: Award (A1) for correct values for  $x$ ,  $\Sigma f$ .*

(c)



(A4) 4

*Notes: Award (A2) for 6 or more points correct, (A1) for 4/5 points correct.*

*Award (A1) for a reasonable graph, (A1) for the correct axes and the given scales.*

(d) Median =  $87 \pm 2$  (A1)

Lower quartile =  $65 \pm 2$  (A1)

Upper quartile =  $123 \pm 2$  (A1) 3

[10]

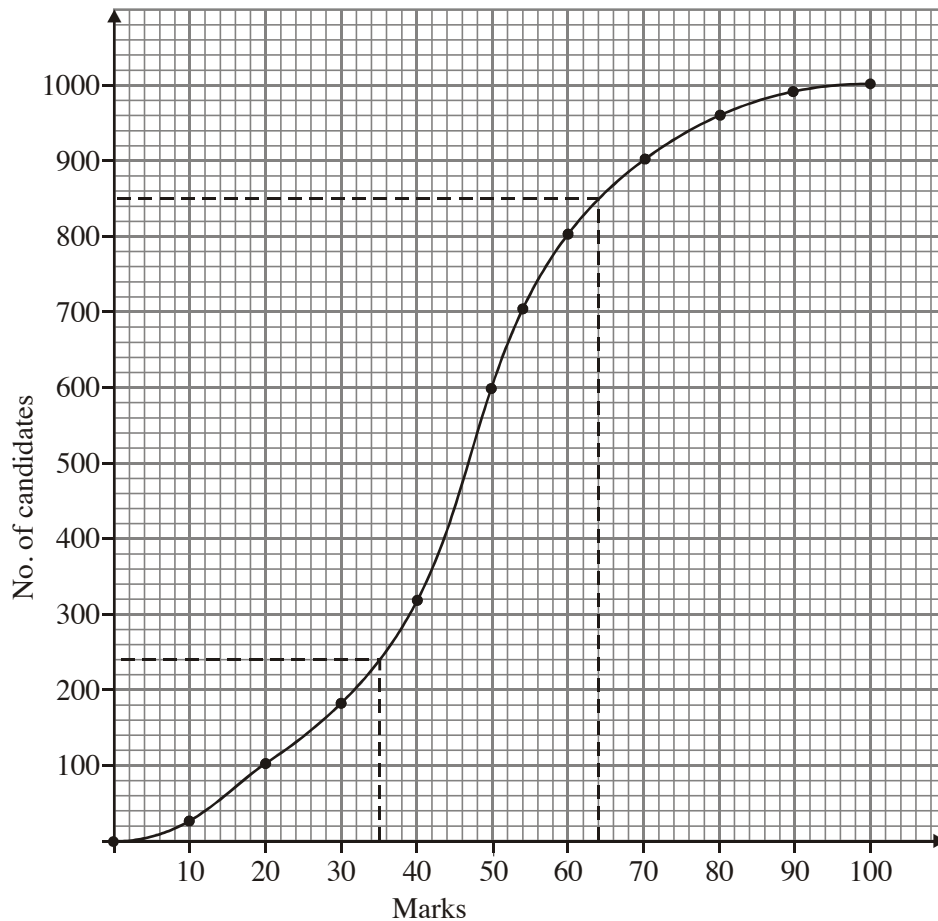
41.) (a)

Mark	≤ 10	≤ 20	≤ 30	≤ 40	≤ 50	≤ 60	≤ 70	≤ 80	≤ 90	≤ 100
No. of Candidates	15	65	<b>165</b>	335	595	815	905	950	980	<b>1000</b>

(A3) 3

*Note: Award (A1) for 165, (A1) for 1000, (A1) if all other entries are correct.*

(b)



(A5) 5

*Notes: Vertical axis and scale  
Horizontal axis and scale  
Points  
Curve (allow polygon)*

(A1)

(A1)

(A1)

(A2)

(c)

(i)

Median = 46(M1)(A1)

(ii) Scores < 35: 240 candidates

(M1)(A2)

(iii) Top 15%  $\Rightarrow$  Mark  $\geq$  63

(M1)(A1)(A1)

8

*Notes: Accept the answers from the student's graph.*

*In each part, award (M1) for the dotted lines on the graph.*

$$42.) \quad \text{Mean} = \frac{(72 \times 1.79) + (28 \times 1.62)}{100} \quad (\text{M1})(\text{M1})(\text{M1})$$

$$= 1.7424 (= 1.74 \text{ to 3 sf}) \quad (\text{A1}) \quad (\text{C4})$$

**[4]**

$$43.) \quad (\text{a}) \quad m = \frac{300}{25} \quad (\text{M1})$$

$$= 12 \quad (\text{A1}) \quad (\text{C2})$$

$$(\text{b}) \quad s = \sqrt{\left(\frac{625}{25}\right)}$$

$$= 5$$

(M1)

(A1) (C2)

**[4]**