Stats 2 Calc Answers

1)

(a) $\sum fx = 1(2) + 2(4) + ... + 7(4), \quad \sum fx = 146 + 5x$ (seen anywhere) ***A1***

evidence of substituting into mean $= \dfrac{\sum fx}{\sum f}$ ***(M1)***

correct equation ***A1***

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

$x = 14$ ***A1*** ***N2***

(b) $\sigma = 1.54$ ***A2*** ***N2***

[6 marks]

2)

1. (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 – their value of p, $120 - (9 + 25 + 35 + 11)$

$q = 40$ ***A1*** ***N2***

(b) evidence of appropriate approach ***(M1)***

e.g. substituting into $\dfrac{\sum fx}{n}$, division by 120

mean $= 3.16$ ***A1*** ***N2***

(c) 1.09 ***A1*** ***N1***

[7 marks]

3)

(a) 18 ***A1*** ***N1***

(b) (i) 10 ***A2*** ***N2***

(ii) 44 ***A2*** ***N2***

[5 marks]

4)

(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. 63rd student, $\dfrac{125}{2}$

median is 17 (sit-ups) ***A1*** ***N2***

(c) evidence of substituting into $\dfrac{\sum fx}{125}$ ***(M1)***

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

mean $= 17.4$ ***A1*** ***N2***

[7 marks]

5)

(a) $\sigma = 1.61$ ***A2*** ***N2***

(b) median $= 4.5$ ***A1*** ***N1***

(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) ***A1*** ***N3***

[6 marks]

6) **Part A**

(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***

[6 marks]

(b) Evidence of finding 40 % (60 %) of 150 ***M1***

Number spending less than k minutes is $(150 - 60) = 90$ ***(A1)***

$k = 7$ ***A1*** ***N2***

[3 marks]

(c) (i)

t (minutes)	$0 \le t < 2$	$2 \le t < 4$	$4 \le t < 6$	$6 \le t < 8$	$8 \le t < 10$	$10 \le t < 12$
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***

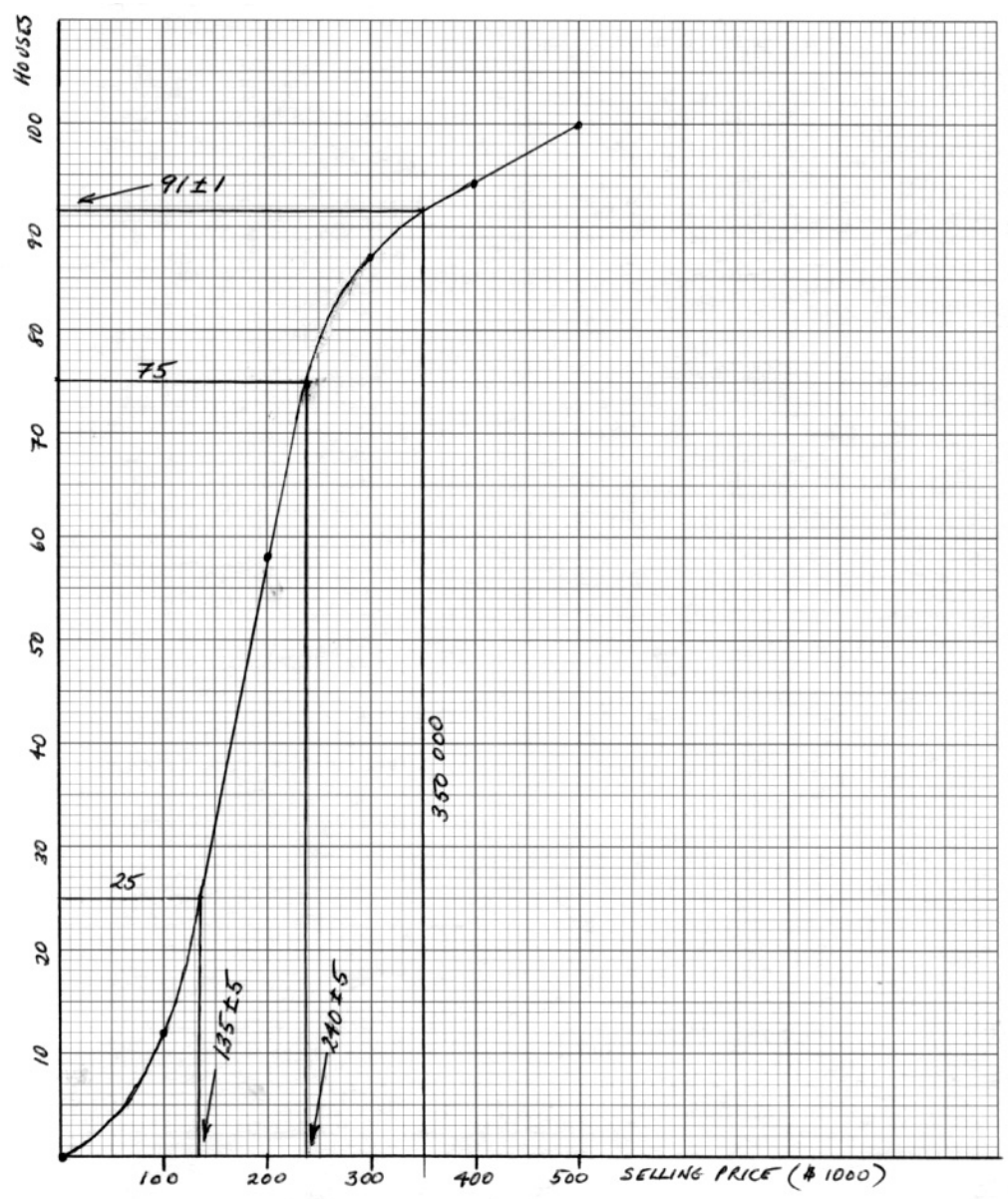
$$\text{mean} = \left(\frac{1\times10 + 3\times23 + 5\times37 + 7\times38 + 9\times27 + 11\times15}{150}\right)$$

$= 6.25$ (min), 6 min 15 secs ***A1*** ***N1***

[5 marks]

Sub-total [14 marks]

7) (a)



(A1)(A2)(A1)

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.

[4 marks]

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

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

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

[3 marks]

(c) $a = 94 - 87 = 7, b = 100 - 94 = 6$ ***(A1)(A1)***

[2 marks]

7) continued

(d) $\text{mean} = \dfrac{12(50)+46(150)+29(250)+7(350)+6(450)}{100}$ ***(M1)***

$= 199$ or $\$199000$ ***(A1)***

OR

mean $= 199$ or $\$199000$ ***(G2)***

[2 marks]

(e) (i) $\$350000 \Rightarrow 91.5$

Number of *De luxe* houses $\simeq 100 - 91.5$ ***(M1)***

$= 9$ or 8 ***(A1)***