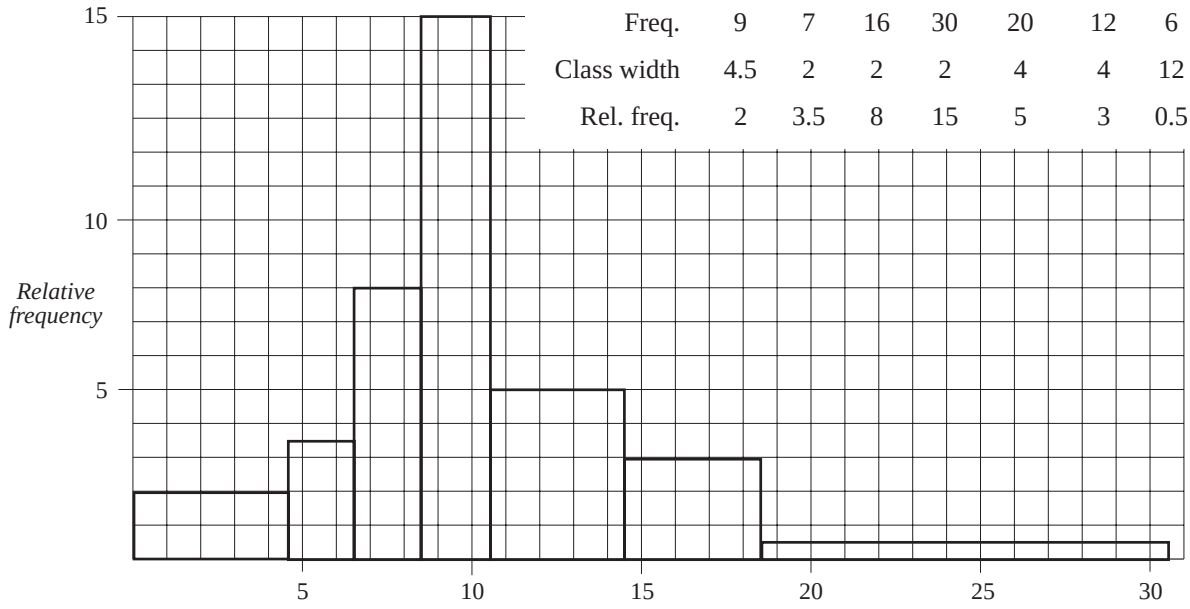
Revision Test 20.4 Answers

1. (a)

Time	0-4	5-6	7-8	9-10	11-14	15-18	19-30
Freq.	9	7	16	30	20	12	6
Class width	4.5	2	2	2	4	4	12
Rel. freq.	2	3.5	8	15	5	3	0.5



Rel. frequencies B2
axis B1
histogram B2

(b) 9.5 minutes B2 *(7 marks)*

2. (a) $0.25 \times 15 + 0.52 \times 12 + 0.13 \times (-2) + 0.10 \times 11$ (A1 for –2) M2 A1 A1

$= 10.83\%$ A1

(b) $1.1083 = \dfrac{r^2}{3^2} \Rightarrow r^2 = 9 \times 1.1083$ M1 A1

$r \approx 3.16$ A1

(c) More efficient organisation, e.g. more computerised B1 *(9 marks)*

3. (a) Median is 73rd item of data. B1

Estimate $= 14.5 + \dfrac{4}{21} \times 5 \approx 15.5$ (accept 15) M1 A1

(b) (i) median B1

(ii) better representation when data is skewed B1

(c) $p = \dfrac{24}{145} = 0.166$ M1 A1 *(7 marks)*

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4. (a) mean $= \frac{108}{6} = 18$ B1

variance $= 5^2 = 25$ B1

(b) new mean $= \frac{133}{7} = 19$ B1

$25 = \frac{\sum x_i^2}{6} - 18^2 \Rightarrow \sum x_i^2 = 2094$ B1

new variance $= \frac{1}{7}(2094 + 625) - 19^2 = 27.43$ M1 A1

new s.d. ≈ 5.24 A1 *(7 marks)*

5. (a) Curve through correct points. (one error - B2) B3

(b) (i) 350 (construction) M1 A1

(ii) $450 - 240 = 210$ M1 A1

(iii) 20 B1

(iv) 9 B2 *(10 marks)*

6. (a) Decreased B1

(b) $525 \times \frac{125}{100} =$ £656.25 M1 A1

(c) $\left(40 \times \frac{80}{100}\right) + \left(25 \times \frac{121}{100}\right) + \left(15 \times \frac{125}{100}\right) + \left(15 \times \frac{110}{100}\right) + \left(5 \times \frac{130}{100}\right)$ M2 A1

$= 104$ A1 *(7 marks)*

7. (a) So that meaningful comparisons can be made. B1

(b) Seatown : 5.13 Brightbury : 13.11 (one correct:B2) B3

(c) Seatown : 11.73 Brightbury : 9.05 B2 B2

(d) This is not born out by the standardised death rates: overall Brightbury is a healthier place to live. B2 *(10 marks)*

8. (a) 3rd quarter 1985 B1

(b) Correct plots (see next page) (one mistake –B1) B2

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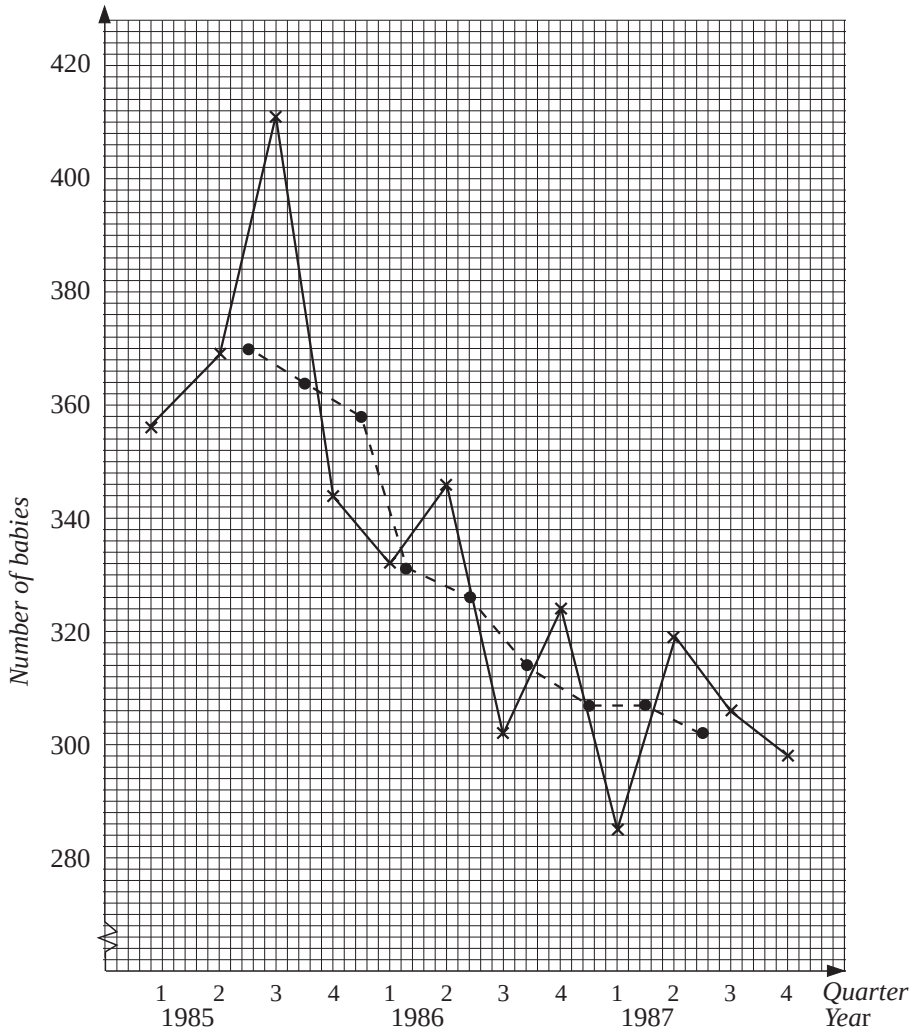

(c) (i)

1480	370
1456	364
1433	358.25
1324	331
1304	326
1257	314.25
1230	307.5
1234	308.5
1208	302

(–1 for each mistake) B3

(ii) Plot (see above) B2

(d) Underlying decrease in births B1

(e) Firs, since the numbers born there are relatively small and could be accommodated in Murray. B2 *(11 marks)*

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9. (a)

Peter	1	2	3	4	5	6	7	8	9	10	(labelling 1-10)
Richard	2	1	6	3	5	4	9	7	10	8	(corresponding labels)
$\lvert d \rvert$	1	1	3	1	0	2	2	1	1	2	
d^2	1	1	9	1	0	4	4	1	1	4	

B1 M1

$\sum d^2 = 26$ A1

$r = 1 - \dfrac{6 \times 26}{10 \times 99} = 0.842$ A1

(b) Strong positive correlation between these two entries. B1

(c) The winning entry was unlike both Peter's and Richard's entries. B2 *(7 marks)*

10. (a) Line of best fit B2

(b) $y = 0.008x - 2$ method (2 equations) M2
coefficients A1 A1

(c) (i) £11600 B1

(ii) Almost outside data range on which line of best fit is drawn. B1 *(8 marks)*

11. (a) It enables fair comparisons to be made. B1

(b) (i) $\left(\dfrac{85 - 44.1}{13.8}\right) \times 16 + 50 = 97.4$ M1 A1

$\left(\dfrac{87 - 65.2}{8.9}\right) \times 16 + 50 = 89.2$ M1 A1

(ii) Michelle : $80.2 + 97.4 = 177.6$
Rajinder : $89.2 + 91.6 = 180.8$ ← Rajinder B1 *(6 marks)*

12. (a) (i) $\dfrac{5}{50} = \dfrac{1}{10}$ B1

(ii) Win for 12, 21, 23, 32, 34, 43, 45, 54, 56 M1

$p = \dfrac{9}{50}$ A1

(b) (i) $\dfrac{36}{50} \times \dfrac{35}{49} = 0.514$ M1 A1

(ii) $\dfrac{5}{50} \times \dfrac{4}{49} = 0.00816$ M1 A1

(iii) $\left(\dfrac{5}{50} \times \dfrac{36}{49}\right) + \left(\dfrac{36}{50} \times \dfrac{5}{49}\right) + \left(\dfrac{9}{50} \times \dfrac{8}{49}\right)$ B1 B1 B1

$= 0.176$ B1 *(11 marks)*

TOTAL 100 marks