FOUNDATION

6.1 Crude Rate and Rates of Change: 1-hour Pack

EDEXCEL 1ST0 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 In one year, County E (population 125000) had 497 road accidents and Region D (population 50000) had 42 road accidents.

(a) Work out the crude rate per 1000 for each place, to 2 decimal places if needed.

(b) Which place has the higher rate?

(Total for Question 1 is 4 marks)

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2 In one year, County E (population 20000) had 557 deaths and Town B (population 40000) had 323 deaths.

(a) Work out the crude rate per 1000 for each place, to 2 decimal places if needed.

(b) Which place has the higher rate?

(Total for Question 2 is 4 marks)

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3 In one year, Town B (population 50000) had 54 births and County E (population 25000) had 83 births.

(a) Work out the crude rate per 1000 for each place, to 2 decimal places if needed.

(b) Which place has the higher rate?

(Total for Question 3 is 4 marks)

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4 In one year, Region D (population 50000) had 537 deaths and Town B (population 125000) had 303 deaths.

(a) Work out the crude rate per 1000 for each place, to 2 decimal places if needed.

(b) Which place has the higher rate?

(Total for Question 4 is 4 marks)

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5 A health authority applies local age-specific death rates (per 1000) to a standard population.

Age group	Local rate per 1000	Standard population
under 30	3	30000
30 to 59	15	60000
60 and over	54	20000

(a) Work out the expected number of deaths in each age group in the standard population.

(b) Work out the standardised death rate per 1000, to 2 decimal places if needed.

(Total for Question 5 is 4 marks)

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6 A health authority applies local age-specific death rates (per 1000) to a standard population.

Age group	Local rate per 1000	Standard population
under 30	2	30000
30 to 59	20	60000
60 and over	39	20000

(a) Work out the expected number of deaths in each age group in the standard population.
(b) Work out the standardised death rate per 1000, to 2 decimal places if needed.

(Total for Question 6 is 4 marks)

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7 In one year, County E (population 125000) had 476 road accidents and Region D (population 40000) had 435 road accidents.
(a) Work out the crude rate per 1000 for each place, to 2 decimal places if needed.
(b) Which place has the higher rate?

(Total for Question 7 is 4 marks)

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8 A health authority applies local age-specific death rates (per 1000) to a standard population.

Age group	Local rate per 1000	Standard population
under 30	2	40000
30 to 59	19	60000
60 and over	24	10000

(a) Work out the expected number of deaths in each age group in the standard population.
(b) Work out the standardised death rate per 1000, to 2 decimal places if needed.

(Total for Question 8 is 4 marks)

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9 In one year, County E (population 80000) had 158 deaths and Region D (population 80000) had 346 deaths.
(a) Work out the crude rate per 1000 for each place, to 2 decimal places if needed.
(b) Which place has the higher rate?

(Total for Question 9 is 4 marks)

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10 Elmswood has a population of 8,000 and recorded 96 live births last year. Riverside has a population of 20,000 and recorded 180 live births in the same year.

(a) Calculate the crude birth rate for Elmswood. **(1)**

(b) Calculate the crude birth rate for Riverside. **(1)**

(c) Riverside recorded more live births than Elmswood (180 compared with 96), but has a lower crude birth rate. Give one reason why this can happen. **(1)**

(Total for Question 10 is 3 marks)

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11 A company uses 2021 as the base year for its sales index (base year index = 100). In 2021, monthly sales were £15,000.

(a) In 2023, monthly sales were £18,000. Calculate the sales index number for 2023. **(1)**

(b) In 2024, the sales index (2021 = 100) was 90. State whether sales had increased or decreased since 2021, by what percentage, and calculate the actual monthly sales figure for 2024. **(2)**

(Total for Question 11 is 3 marks)

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12 The table shows the population and number of deaths recorded in three villages last year.

Village	Population	Deaths
Ashby	15,000	165
Barton	20,000	140
Coombe	9,000	108

(a) Calculate the crude death rate for each village. **(2)**

(b) Write down which village has the highest crude death rate. **(1)**

(Total for Question 12 is 3 marks)

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Mark scheme · 6.1 Crude Rate and Rates of Change: 1-hour Pack

Question 1

497 / 125000 x 1000	**M1**
3.98 cao	**A1**
0.84 cao	**A1**
County E	**B1**

Answer: (a) 3.98 and 0.84; (b) County E

Question 2

557 / 20000 x 1000	**M1**
27.85 cao	**A1**
8.08 cao	**A1**
County E	**B1**

Answer: (a) 27.85 and 8.08; (b) County E

Question 3

54 / 50000 x 1000	**M1**
1.08 cao	**A1**
3.32 cao	**A1**
County E	**B1**

Answer: (a) 1.08 and 3.32; (b) County E

Question 4

537 / 50000 x 1000	**M1**
10.74 cao	**A1**
2.42 cao	**A1**
Region D	**B1**

Answer: (a) 10.74 and 2.42; (b) Region D

Question 5

rate x standard population / 1000	**M1**
expected deaths 90, 900, 1080	**A1**
total expected deaths divided by 110000, x 1000	**M1**
18.82 cao	**A1**

Answer: (a) 90, 900, 1080; (b) 18.82

Question 6

rate x standard population / 1000	**M1**
expected deaths 60, 1200, 780	**A1**
total expected deaths divided by 110000, x 1000	**M1**
18.55 cao	**A1**

Answer: (a) 60, 1200, 780; (b) 18.55

Question 7

476 / 125000 x 1000	**M1**
3.81 cao	**A1**
10.88 cao	**A1**
Region D	**B1**

Answer: (a) 3.81 and 10.88; (b) Region D

Question 8

rate x standard population / 1000	**M1**
expected deaths 80, 1140, 240	**A1**
total expected deaths divided by 110000, x 1000	**M1**
13.27 cao	**A1**

Answer: (a) 80, 1140, 240; (b) 13.27

Question 9

158 / 80000 x 1000	**M1**
1.98 cao	**A1**
4.33 cao	**A1**
Region D	**B1**

Answer: (a) 1.98 and 4.33; (b) Region D

Question 10

(a) 12 (per 1000) cao	**B1**

(a) Answer: 12 per 1000

(b) 9 (per 1000) cao	**B1**

(b) Answer: 9 per 1000

(c) Riverside's population is much larger, so its births are shared across more people, giving a lower rate despite the higher raw count, oe	**B1**

(c) Answer: Riverside has a much larger population, so even though it has more births overall, its births per 1000 people are lower than Elmswood's.

Question 11

(a) 120 cao	**B1**

(a) Answer: 120

(b) 15000 x 0.9, oe	**M1**
(b) decreased by 10%, giving £13500, cao	**A1**

(b) Answer: Decreased by 10%; 2024 monthly sales = £13,500

Question 12

(a) correct method shown (deaths / population x 1000) for at least one village	**M1**
(a) all three correct: Ashby 11, Barton 7, Coombe 12	**A1**

(a) Answer: Ashby 11 per 1000; Barton 7 per 1000; Coombe 12 per 1000

(b) Coombe cao (ft their rates from part (a))	**B1**

(b) Answer: Coombe

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