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| Question | | Working | Answer | Mark | Notes |
| 1 |  | =  The negative sign represents a decrease. | −5.58%  + comment | 3 | M1  A1 Accept ± 5.58 to 5.6  C1 for suitable comment e.g. the negative sign represents a decrease. |
| 2 |  | **=** 89743.2  Or  = 244 808 | Verification + comment | 3 | M1  A1  C1 for suitable comment e.g. The figure in the table is 89600 which is a rounded figure and the 245200 and 36.6 are rounded figures  Or  M1  A1  C1 for suitable comment e.g. The figure in the table is 245200 which is a rounded figure and the 89600 and 36.6 are rounded figures |
| 3 |  | **=** 251063. 8....  The estimate is 251100 | 251100 | 3 | M1  A1  A1 for 251 100 or 251 000 |
| 4 |  | Volume of site = 200 × 200 × 15 = 600 000 m3 Volume of 1 year of landfill = 66 000 × 0.9 = 59 400 m3 Number of years = 600 000 ÷ 59 400 = 10 years. | 2030 | 4 | M1 M1 M1 A1 |
| 5 | (a) |  |  | 4 | M1 scatter graph  M1 at least 5 points plotted correctly  A1 all points plotted correctly  B1 consistent linear scale on both axes |
|  | (b) |  | Valid comment for gradient in context.  Valid comment for intercept in context.  Valid comment for correlation coefficient in context. | 3 | C1 e.g a 1 tonne increase in HHW is related to a 0.7 tonne increase in MSW.  C1 e.g the line predicts a tonnage of about 90000 when the HHW is very low.  C1 HHW and MSW have a high correlation (unsurprising since HHW is a substantial constituent of MSW). |

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| Mathematics in Context - Waste and recycling | | | | | |
| Question | | Working | Answer | Mark | Notes |
| 6 |  | .   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | **2005** | **2008** | **2011** | **2014** | | **HHW** | 228066 | 231010 | 212754 | 197000 | | **Households** | 181000 | 187000 | 193000 | 195000 | | **HHW per household** | 1.260 | 1.235 | 1.102 | 1.124 | |  | 4 | M1 for calculation of one HHW per household.  M1 for calculating all 2005 and 2014 values. M1 for at least two values correct.  C1 on valid comment based on correct figures for at least 3 different years. E.g the HHW decreased throughout the period 2005 to 2014. |
| 7 | (a) | 197 000 × (606 - 545) ÷1000 = | 12017 tonnes | 3 | M1 for 197 000 × (606 - 545)  M1(dep) for ÷ 1000  A1 Accept awrt 12000 |
|  | (b) | Population = 492 000 Number of people per household = 2.35  No of households = 492 000 ÷ 2.35 = 209361  Production of HHW after recycling = 209361 \* 0.606 = 126873 tonnes  HHW = 126873 ÷ 0.571 = 222194 tonnes before recycling  MSW = 0.707 × 222194 + 91300 = 248391 tonne from the regression line  Sent to landfill 248391 − (222194 − 126873) − 50000 | 103070 tonnes | 7 | M1 '492000' ÷ '2.35'( = 209361)  M1 '209361' × 0.606 (= 126873) tonnes  M1 '126873' ÷0.571( = 222194)  M1 0.707× '222194' + 91300  M1 '248391' - ('222194 - 126873') - 50000  A1 for 245000 - 255000  C1 For working shown and at least 2 assumptions stated or 1 assumption stated and justified from the (trends in ) the data.  Other assumptions and estimates are possible, e.g. if 0.581 is used in step 3, the final answer is 104190 tonnes. |