**Finding the Median**

**Linear Interpolation**



**Formula**

Examples

**Class width**

|  |  |
| --- | --- |
| **Weight of cat to nearest kg** | **Frequency** |
| $$10-12$$ | $$7$$ |
| $$13-15$$ | $$2$$ |
| $$16-18$$ | $$9$$ |
| $$19-20$$ | $$4$$ |

**Linear Interpolation with gaps**

Example

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**Test Your Understanding**

Use linear interpolation to estimate the median of the following:

|  |  |
| --- | --- |
| **Age of relic (years)** | **Frequency** |
| 0-1000 | 24 |
| 1001-1500 | 29 |
| 1501-1700 | 12 |
| 1701-2000 | 35 |

1)

|  |  |
| --- | --- |
| **Shark length (cm)** | **Frequency** |
| $$40\leq x<100$$ | 17 |
| $$100\leq x<300$$ | 5 |
| $$300\leq x<600$$ | 8 |
| $$600\leq x<1000$$ | 10 |

2)

**Supplementary Exercise 1**

**Q1) Solomon Paper A Q5b**



**Q2) Solomon Paper E Q4a**

The ages of 300 houses in a village are recorded given the following table of results.

|  |  |
| --- | --- |
| Age $a$ (years) | Number of houses |
| $$0\leq a<20$$ | $$36$$ |
| $$20\leq a<40$$ | $$92$$ |
| $$40\leq a<60$$ | $$74$$ |
| $$60\leq a<100$$ | $$39$$ |
| $$100\leq a<200$$ | $$14$$ |
| $$200\leq a<300$$ | $$27$$ |
| $$300\leq a<500$$ | $$18$$ |

Use linear interpolation to estimate the median.

**Q3) Solomon Paper L Q7a**

A cyber-café recorded how long each user stayed during one day giving the following results.

|  |  |
| --- | --- |
| Length of stay (minutes) | Number of houses |
| $$0\leq l<30$$ | $$15$$ |
| $$30\leq l<60$$ | $$31$$ |
| $$60\leq l<90$$ | $$32$$ |
| $$90\leq l<120$$ | $$23$$ |
| $$120\leq l<240$$ | $$17$$ |
| $$240\leq l<360$$ | $$2$$ |

Use linear interpolation to estimate the median of these data.

**Q4) S1 May 2013 Q4**

The following table summarises the times, *t* minutes to the nearest minute, recorded for a group of students to complete an exam.



[You may use ∑f*t*2 *=* 134281.25]

(*a*) Estimate the mean ~~and standard deviation~~ of these data. **(5)**

(*b*) Use linear interpolation to estimate the value of the median. **(2)**

Exercise 2C Pages 27-28