

**Q1.** On her way to work Janice passes through four sets of traffic lights. She records the number of times she stops at traffic lights each day. The table shows her results for ten weeks.

Number of stops each day	Frequency (number of days)
0	1
1	6
2	12
3	15
4	16

(a) Calculate the mean number of stops each day.

.....  
 .....  
 .....

Answer .....

(3)

(b) Janice says that she stops at every set of traffic lights on most days. She is wrong.

Explain why she is wrong.

.....  
 .....

(1)

(c) On average, how many days per week does Janice work?

.....

Answer .....

(1)

(Total 5 marks)

**Q2.** Seb investigates whether members of an athletics club perform better than non-members in a 10 kilometre race.

The table summarises the finishing times of the members.

Finishing time, $t$ (minutes)	Frequency		
$30 \leq t < 40$	10		
$40 \leq t < 50$	12		
$50 \leq t < 60$	6		
$60 \leq t < 70$	2		

(a) (i) Calculate an estimate of the mean finishing time of the members.

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 .....  
 .....  
 .....

Answer ..... minutes

(4)

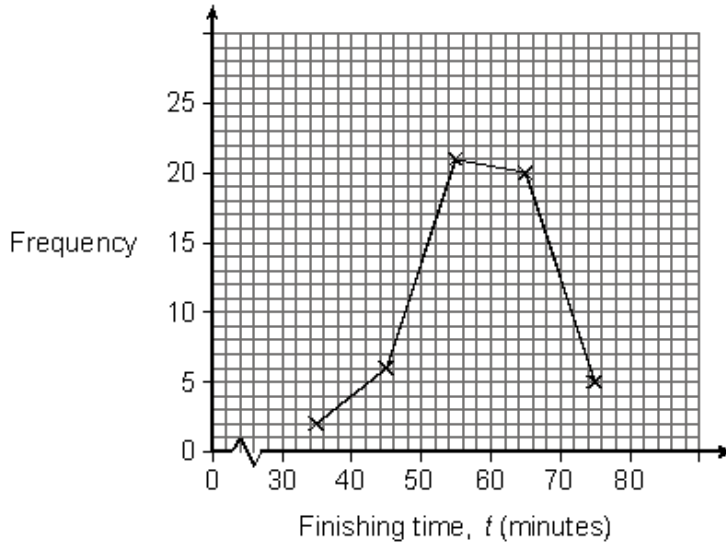
(ii) What fraction of the members finish in less than 50 minutes?

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Answer .....

(2)

(b) The frequency polygon for the finishing times of non-members is shown below.



(i) On the same axes draw the frequency polygon for the finishing times of the members.

(2)

(ii) Seb claims that on average non-members are slower and have more varied finishing times than members.

How can you tell that **both** of Seb's claims are correct?

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(2)

(c) Brendan finished 11<sup>th</sup> in the race.

Which of the following could be his finishing time?  
Circle your answer.

39 minutes      42 minutes      48 minutes      52 minutes

Explain your choice of answer.

.....

.....

(2)  
(Total 12 marks)

**Q3.** The table shows the height\_s of 30 students in a class.

Height, $h$ , (cm)	Number of students
$140 < h \leq 144$	4
$144 < h \leq 148$	5
$148 < h \leq 152$	8
$152 < h \leq 156$	7
$156 < h \leq 160$	5
$160 < h \leq 164$	1

By using the midpoints of each group, calculate an estimate for the mean height\_ of the students.

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Answer ..... cm

**(Total 3 marks)**

**Q4.** The table shows the age, in years, of workers in a factory.

Age, $x$ (years)	Number of workers
$15 \leq x < 20$	4
$20 \leq x < 25$	10
$25 \leq x < 30$	6
$30 \leq x < 40$	22
$40 \leq x < 60$	8

Calculate an estimate of the mean age of these workers.

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Answer ..... years

**(Total 4 marks)**

**Q5.** The table summarises the travelling time to work of 80 people.

<b>Travelling time, <math>t</math> (minutes)</b>	<b>Number of people</b>
$0 < t \leq 10$	6
$10 < t \leq 20$	17
$20 < t \leq 30$	19
$30 < t \leq 40$	23
$40 < t \leq 50$	15

Calculate an estimate of the mean travelling time.

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.....  
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.....  
.....  
.....

Answer ..... minutes

**(Total 4 marks)**

- M1.** (a) Attempts to calculate  $fx$  with at least one of 24, 45, 64 correct  
*0, 6, 24, 45, 64* **M1**
- Finds Their  $\Sigma fx$  and divides by Their 50  
 $\Sigma fx = 139$   
*Their 50 is either correct or working shown* **M1 dep**
- 2.78  
*Accept 2.8, with working* **A1**
- (b) Valid explanation  
*16 is less than half of the times*  
 *$34 \leq 3$  stops oe*  
*Only 16 out of 50 (and it should be 25)* **B1**
- (c) 5 **B1**
- [5]**

- M2.** (a) (i) Sight of midpoint eg, 35  
*Could be their midpoint eg, 35.5* **B1**
- One correct product  
 eg,  $10 \times$  their midpoint (= 350) if correct  
*Others are  $12 \times$  their 45 (= 540)*  
 *$6 \times$  their 55 (= 330)*  
 *$2 \times$  their 65 (= 130)* **M1**
- $$\frac{\text{Their } 1350}{30}$$
*Must be 30 and midpoints consistent* **M1dep**
- 45 **A1**
- (ii) 
$$\frac{22}{\text{Their } 30}$$
- B1 Numerator } Must be a proper fraction*  
*B1 Denominator }*  
*oe Fraction*  
*SC1 Correct value as decimal or % (0.73 or better)* **B2**

- (b) (i) Correct plots at midpoints  
*B1 One error*  
*Treat not joined or curve as one error*  
*Ignore lines drawn beyond 1<sup>st</sup> and last plot* B2
- (ii) Slower as peak for members is earlier  
*oe must reference peak, highest point or mode* B1
- More varied as graph for non-members is 'wider'  
*oe mentions additional group* B1
- (c) Circles 39 minutes  
*Any indication* B1
- 12 people finished under 40 minutes  
*SC1 For 42 circled and explains 10 under 40 minutes oe* B1

[12]

**M3.** Allow embedded solutions, but if contradicted M marks only

$$4 \times 142 + 5 \times 146 + 8 \times 150 + 7 \times 154 + 5 \times 158 + 1 \times 162$$

$\sum fx$  where  $x$  is midpoint or end point or  
 Values  $\pm 0.5$

*For at least 2 multiplications and additions seen*

M1

Their  $4528 \div 30$

M1 dep

150.9(3 ...)

*151 with working*

A1

[3]

**M4.** Any one correct mid-point seen and used  
ie 17.5, 22.5, 27.5, 35 or 50

*Used in fx (not just added)  
ie 70, 225, 165, ...  
\* Look out for 17, 23, 27 used  
(35, 50) leading to correct answer  
=> M3 A0*

**M1**

$\sum fx$

*fx for their x in class or on boundary, at least 2 products summed*

**M1**

1630  $\div$  50

*Dep on 2nd M1  
"Their"  $\sum fx$  divided by "their" 50*

**M1 dep**

= 32.6

*Accept 32 or 33 from fully correct method*

**A1**

**[4]**

**M5.** 4 or 5 correct midpoints seen  
*or implied*

**M1**

$\sum fx$  at least two products with intention to sum

*Accept incorrect midpoints but must be within  
classes including boundaries*

*Note: Not class widths throughout  
Note: 1840 or 2640  $\Rightarrow$  M1*

**M1**

$\sum fx$  4 or 5 "correct" products summed with intention to divide by 80

*dep on 2nd M1  $\left(\frac{"2240"}{80}\right)$*

*$\frac{1840}{80}$  or  $\frac{2640}{80} \Rightarrow$  M2*

**M1 dep**

28

**A1**

**[4]**



