Q1.   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.

....

....

....

....

....

Answer .... minutes

(4)

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

....

....

Answer ....

(2)

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

Finishing time, t (minutes)
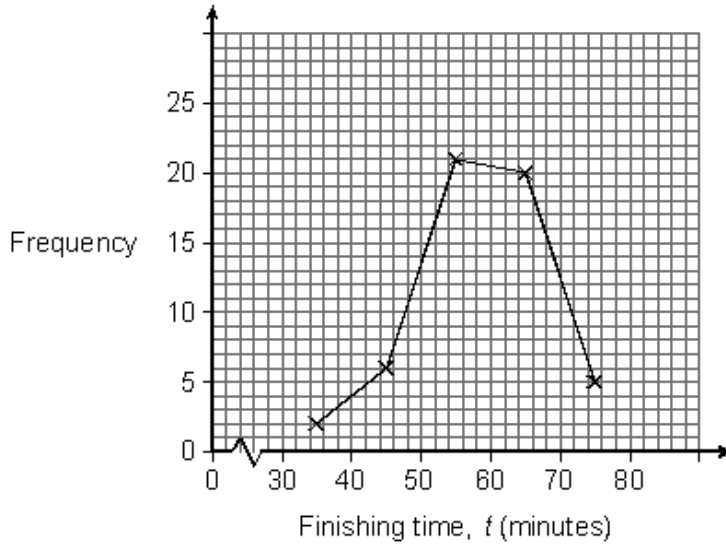
(i)   On the same axes draw the frequency polygon for the finishing times of the members.

(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?

....

....

....

....

(2)

(c) Brendan finished 11th in the race.

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

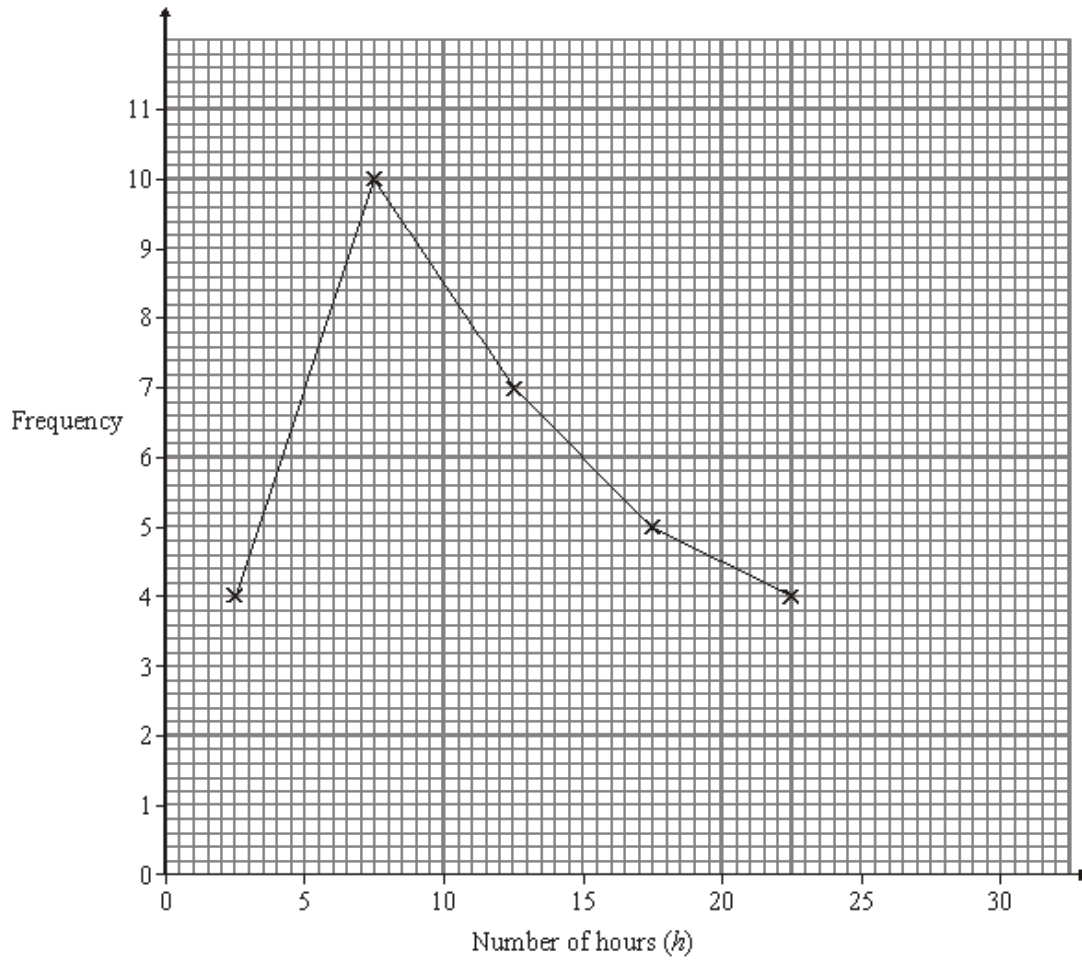39 minutes   42 minutes   48 minutes   52 minutes

Explain your choice of answer.

....

....

(2)
(Total 12 marks)

Q2.   The frequency polygon shows the number of hours of television watched each week by 30 teachers.

(a)   One of the teachers is picked at random.
What is the probability that this teacher watches more than 15 hours of television each week?

....

....

....

Answer ....

(2)

(b)   The number of hours of television watched each week by 30 students is shown below.

Number of hours (h)	Frequency
$0 < h \leq 5$	1
$5 < h \leq 10$	2
$10 < h \leq 15$	7
$15 < h \leq 20$	9
$20 < h \leq 25$	7
$25 < h \leq 30$	4

On the same grid draw a frequency polygon to show this information.

(2)

(c)   Give **two** comparisons between the number of hours of television watched by these teachers and students.

Comparison 1

....

....

Comparison 2

....

....

(2)
(Total 6 marks)

M1. (a) (i) Sight of midpoint eg, 35
Could be their midpoint eg, 35.5

B1

One correct product
eg, 10 × their midpoint (= 350) if correct
Others are 12 × their 45 (= 540)
6 × their 55 (= 330)
2 × their 65 (= 130)

M1

$$\frac{Their\ 1350}{30}$$
Must be 30 and midpoints consistent

M1dep

45

A1

(ii) $\dfrac{22}{Their\ 30}$

B1 Numerator ⎫
B1 Denominator ⎬ *Must be a proper fraction*
                    ⎭
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 1ˢᵗ 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]

M2.   (a)   5 + 4

                    or 9

                                                                      M1

$$\frac{9}{30}$$

                    oe

                                                                      A1

    (b)   (2.5, 1), (7.5, 2), (12.5, 7), (17.5, 9), (22.5, 7), (27.5, 4)
joined within 1 small square, straight lines attempted

                    B1 One error <u>or</u> not joined <u>or</u> joined with curve

                    SC1 for consistent plots at lcb or ucb

                                                                       B2

    (c)   Correct comparison of average <u>and</u> spread, or
Correct comparison of average or spread <u>and</u> one other valid observation

                    eg   Students average time larger oe
                            Allow eg in general, on average, overall

                            Spread of student times larger oe
                            Allow eg larger range, more varied …

                    Other valid observations

                    eg   More students watch from 15 to 25 h
                            Same number (7) watch from 10 to 15 h

                    B1 one correct comparison of average/spread
                            or one valid observation

                                                                   B2

                                                                             [6]