# GCSE to AS-Level transition
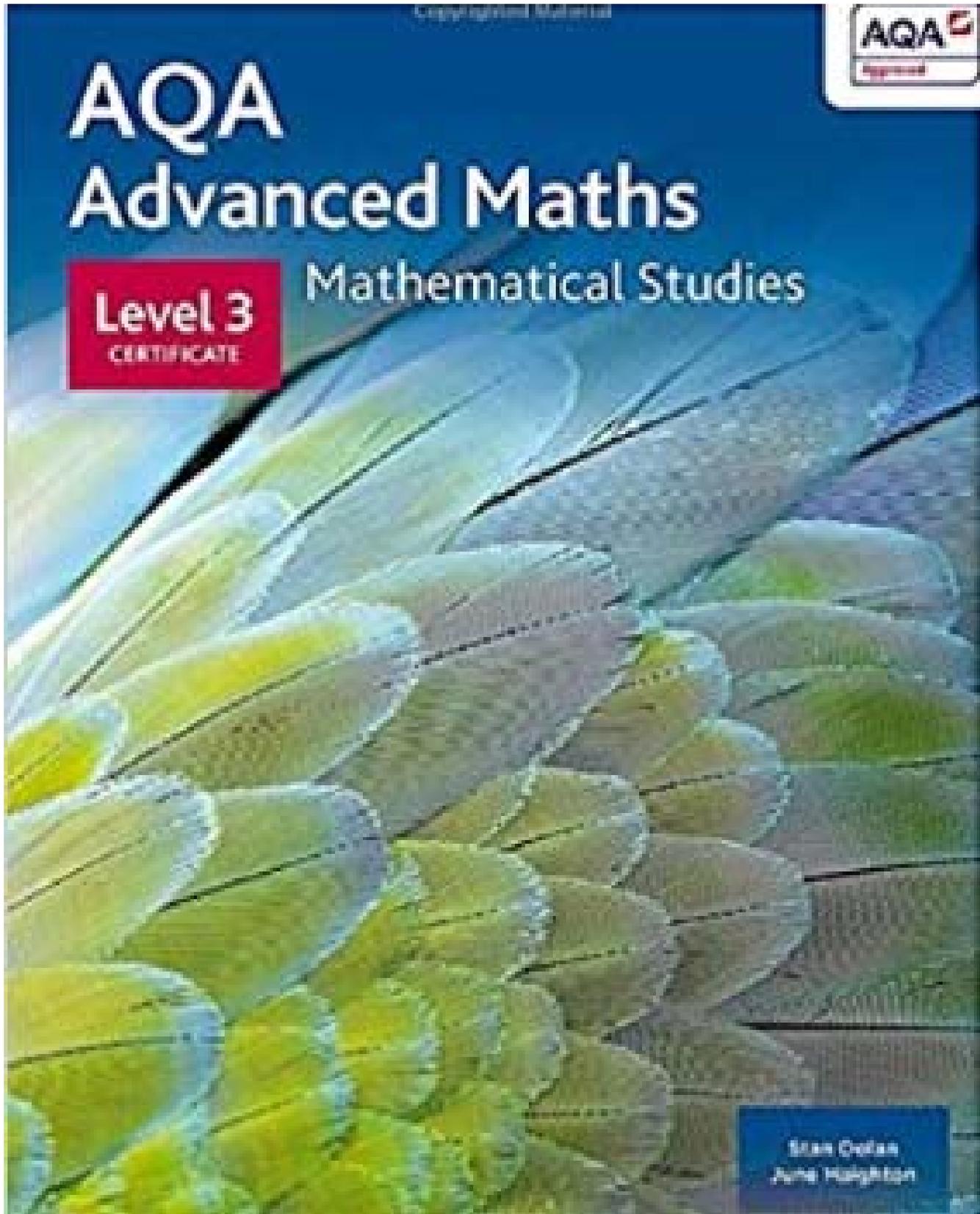
# A. Averages, spread and charts

**1.** The table shows the number of boys in each of four groups.

| Group | A | B | C | D | Total |
|---|---|---|---|---|---|
| Number of boys | 32 | 43 | 38 | 19 | 132 |

Jamie takes a sample of 40 boys stratified by group.
Calculate the number of boys from group B that should be in his sample.

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

**(Total 2 marks)**

**2.** 20 students scored goals for the school hockey team last month.
The table gives information about the number of goals they scored.

| Goals scored | Number of students | |
|---|---|---|
| 1 | 9 | |
| 2 | 3 | |
| 3 | 5 | |
| 4 | 3 | |

(a) Write down the modal number of goals scored.

.........................
**(1)**

(b) Work out the range of the number of goals scored.

.........................
**(1)**

(c) Work out the mean number of goals scored.

.........................
**(3)**
**(Total 5 marks)**

**3.** The table shows information about the heights of 40 bushes.

| Height ($h$ cm) | Frequency |
|---|---|
| $170 \leq h < 175$ | 5 |
| $175 \leq h < 180$ | 18 |
| $180 \leq h < 185$ | 12 |
| $185 \leq h < 190$ | 4 |
| $190 \leq h < 195$ | 1 |

(a) Complete the cumulative frequency table.

| Height ($h$ cm) | Cumulative Frequency |
|---|---|
| $170 \leq h < 175$ | |
| $170 \leq h < 180$ | |
| $170 \leq h < 185$ | |
| $170 \leq h < 190$ | |
| $170 \leq h < 195$ | |

**(1)**

(b) On the grid, draw a cumulative frequency graph for your table.
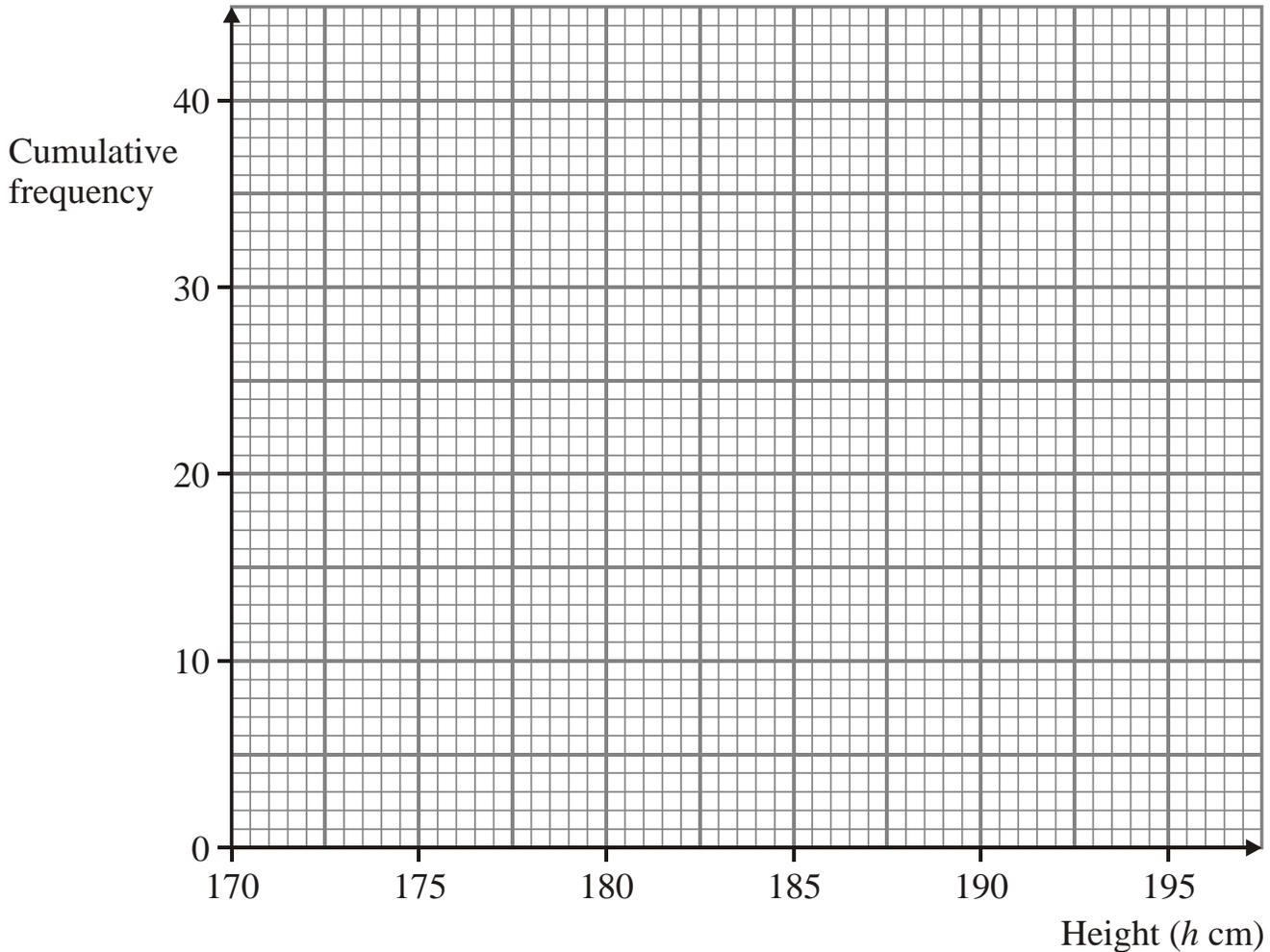


**(2)**

(c) Use the graph to find an estimate for the median height of the bushes.

.......................... cm

**(1)**

**(Total 4 marks)**

**4.** Mary recorded the heights, in centimetres, of the girls in her class.
She put the heights in order.

132    144    150    152    160    162    162    167
167    170    172    177    181    182    182
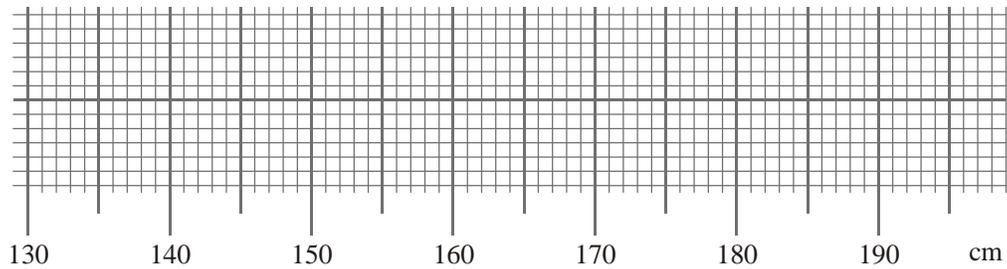
(a)    Find
(i)    the lower quartile,

.......................... cm

(ii)    the upper quartile.

.......................... cm

**(2)**

(b)    On the grid, draw a box plot for this data.

130        140        150        160        170        180        190        cm

**(3)**
**(Total 5 marks)**

**5.** John and Peter each own a garage. They both sell used cars.
The box plots show some information about the prices of cars at their garages.

John's garage

Peter's garage

0        2000        4000        6000        8000        10000        12000

Price (£)

Compare the distribution of the prices of cars in these two garages. Give **two** comparisons.

1 ...............................................................................................................................................

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2 ...............................................................................................................................................

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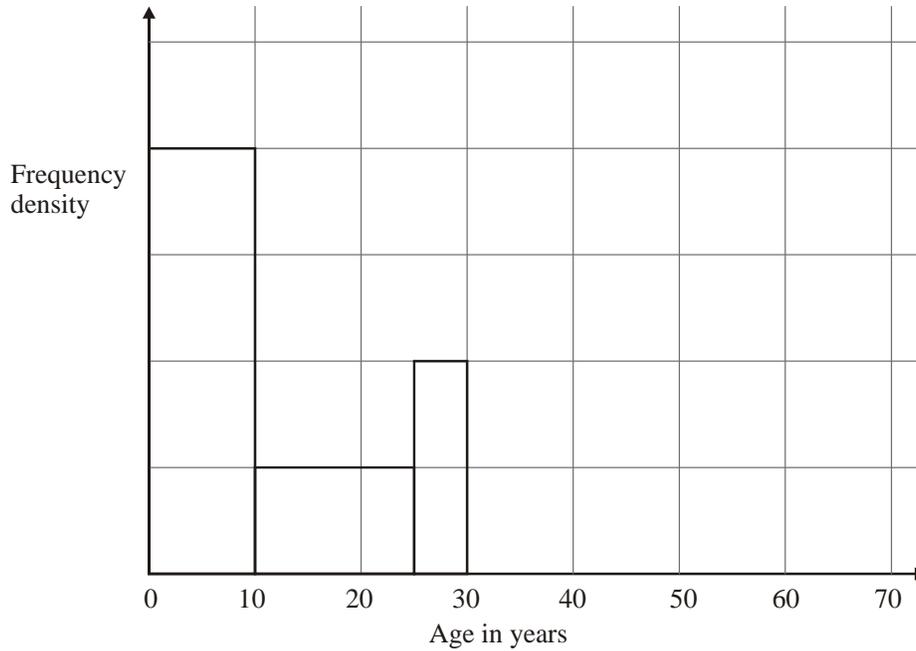
**(Total 2 marks)**

**6.** The incomplete table and histogram give some information about the ages of the people who live in a village.



(a) Use the information in the histogram to complete the frequency table below.

| Age (x) in years | Frequency |
|---|---|
| 0 < x ≤ 10 | 160 |
| 10 < x ≤ 25 | |
| 25 < x ≤ 30 | |
| 30 < x ≤ 40 | 100 |
| 40 < x ≤ 70 | 120 |

**(2)**

(b) Complete the histogram.

**(2)**
**(Total 4 marks)**

# B. Percentages and exchange rates

**7.** Ben bought a car for £12 000.
Each year the value of the car depreciated by 10%.
Work out the value of the car two years after he bought it.
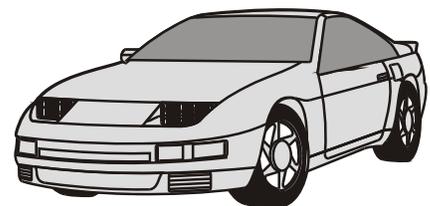
£ .......................
**(Total 3 marks)**

**8.** Wayne bought an engagement ring for Tracy.
The total cost of the ring was £420 **plus** VAT at $17\frac{1}{2}$%.

(a)  Work out the cost of the ring.

£ .............................
**(2)**

Wayne invited 96 people to an engagement party.
Only 60 of the people invited came to the party.

(b)  Express 60 as a percentage of 96.

............................. %
**(2)**
**(Total 4 marks)**

**9.** Loft insulation reduces annual heating costs by 20%.
**After** he insulated his loft, Curtley's annual heating cost was £520.
Work out Curtley's annual heating cost would have been, if he had not insulated his loft.

£ .........................
**(Total 3 marks)**

**10.** Sangita is on holiday in Switzerland.    She buys a train ticket.
She can pay either 100 Swiss Francs or 70 Euros.

£1 = 2.10 Swiss Francs
£1 = 1.40 Euros

She pays in Swiss Francs rather than Euros.
Work out how much she saves.
Give your answer in pounds.

£ ..............................
**(Total 4 marks)**

# C. Graphs

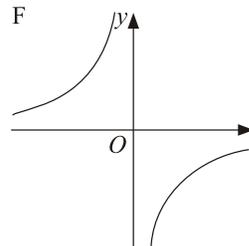**11.** Here are five graphs labelled **A**, **B**, **C**, **D** and **E**.

**A**



**B**



**C**



**D**



**E**
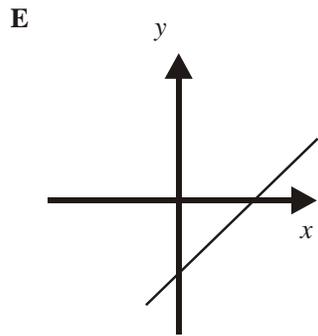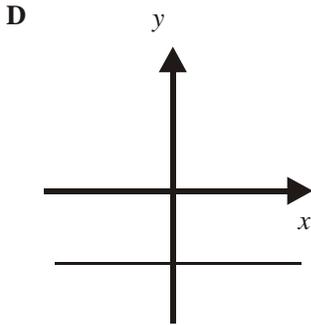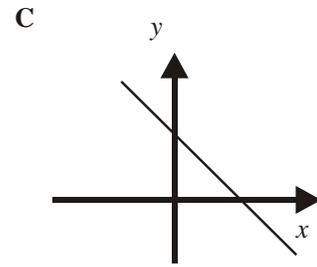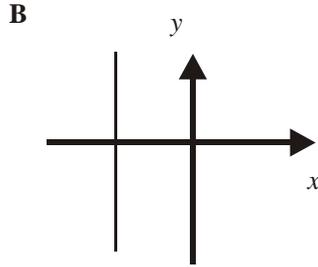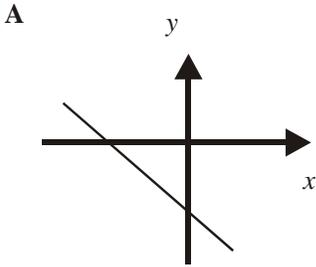


| Equation | Graph |
|---|---|
| $x + y = 5$ | |
| $y = x - 5$ | |
| $y = -5 - x$ | |
| $y = -5$ | |
| $x = -5$ | |

Each of the equations in the table represents one of the graphs **A** to **E**.

Write the letter of each graph in the correct place in the table.

**(Total 3 marks)**

**12.**

**A**



**B**



**C**



**D**



**E**



**F**



**G**



**H**



**I**
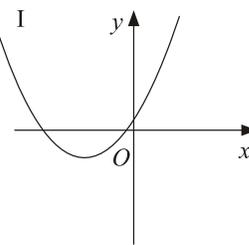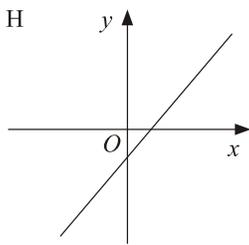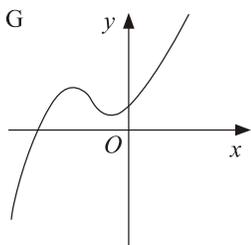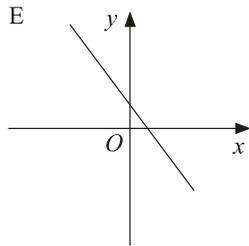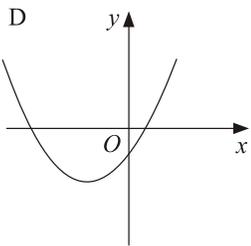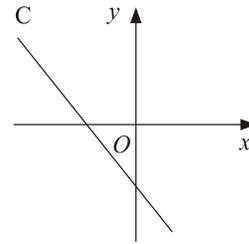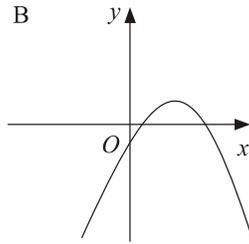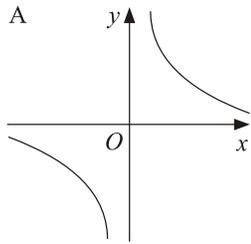


Write down the letter of the graph which could have the equation

(i)   $y = 1 - 3x$

(ii)   $y = \dfrac{1}{x}$

(iii)   $y = 2x^2 + 7x + 3$

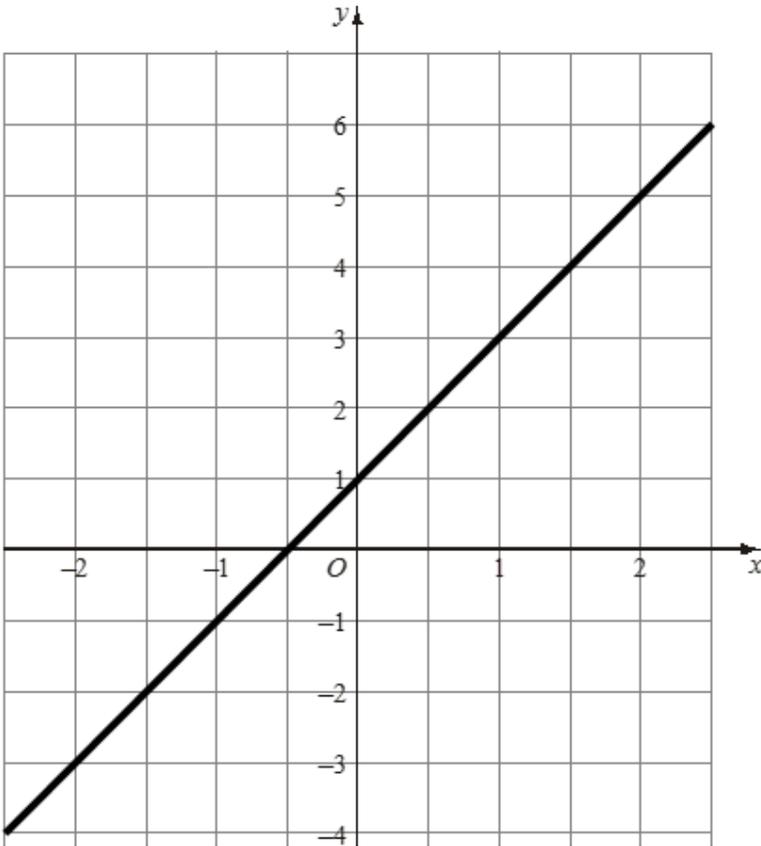......................................   ......................................   ......................................

**(Total 3 marks)**

**13.** Find the equation of the straight line drawn on the axes below.



**(Total 2 marks)**

**14.** A straight line has equation $4y - 5x = 2$
Work out the gradient of this line.

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

**(Total 2 marks)**

**15.** A straight line passes through the points (0, 5) and (3, 17).
Find the equation of the straight line.

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

**(Total 3 marks)**

**16.** Mr Patel has a car.
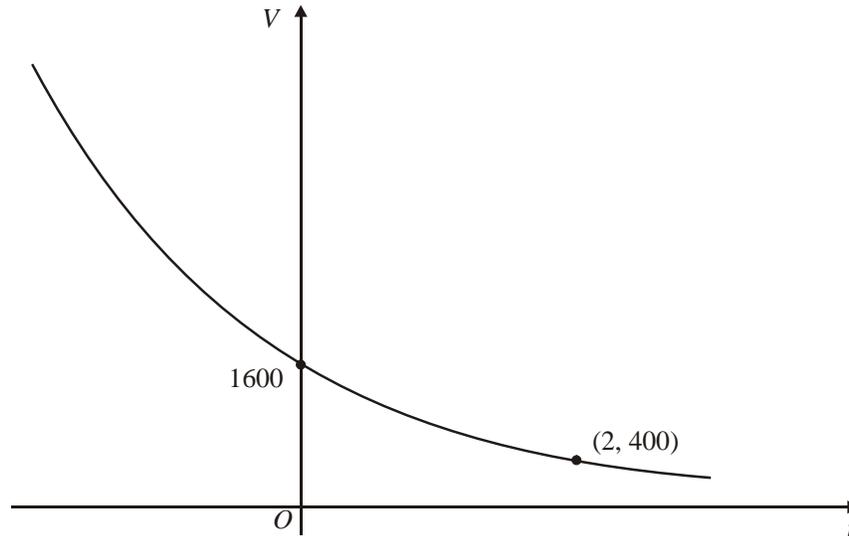


The value of the car on January 1st 2000 was £1600
The value of the car on January 1st 2002 was £400
The sketch graph shows how the value, £V, of the car changes with time.
The equation of the sketch graph is

$$V = pq^t$$

where $t$ is the number of years after January 1st 2000.
$p$ and $q$ are positive constants.

(a)    Use the information on the graph to find the value of $p$ and the value of $q$.

p = ........................ q = ........................
**(3)**

(b)    Using your values of $p$ and $q$ in the formula $V = pq^t$ find the value of the car on January 1st 1998.

£ ...........................
**(2)**
**(Total 5 marks)**

**17.** Here is part of a distance-time graph for a car's journey.
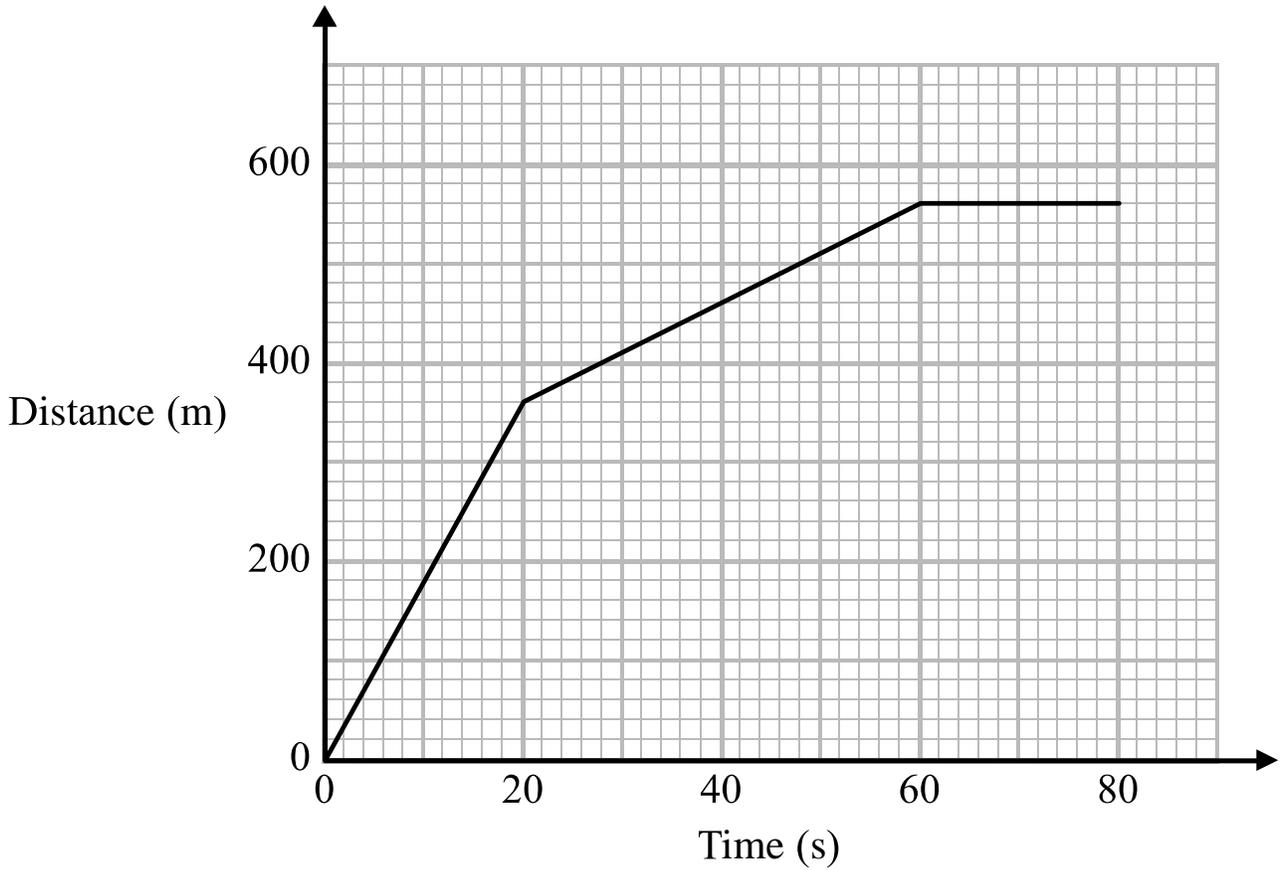


(*a*) Between which two times does the car travel at its greatest speed?
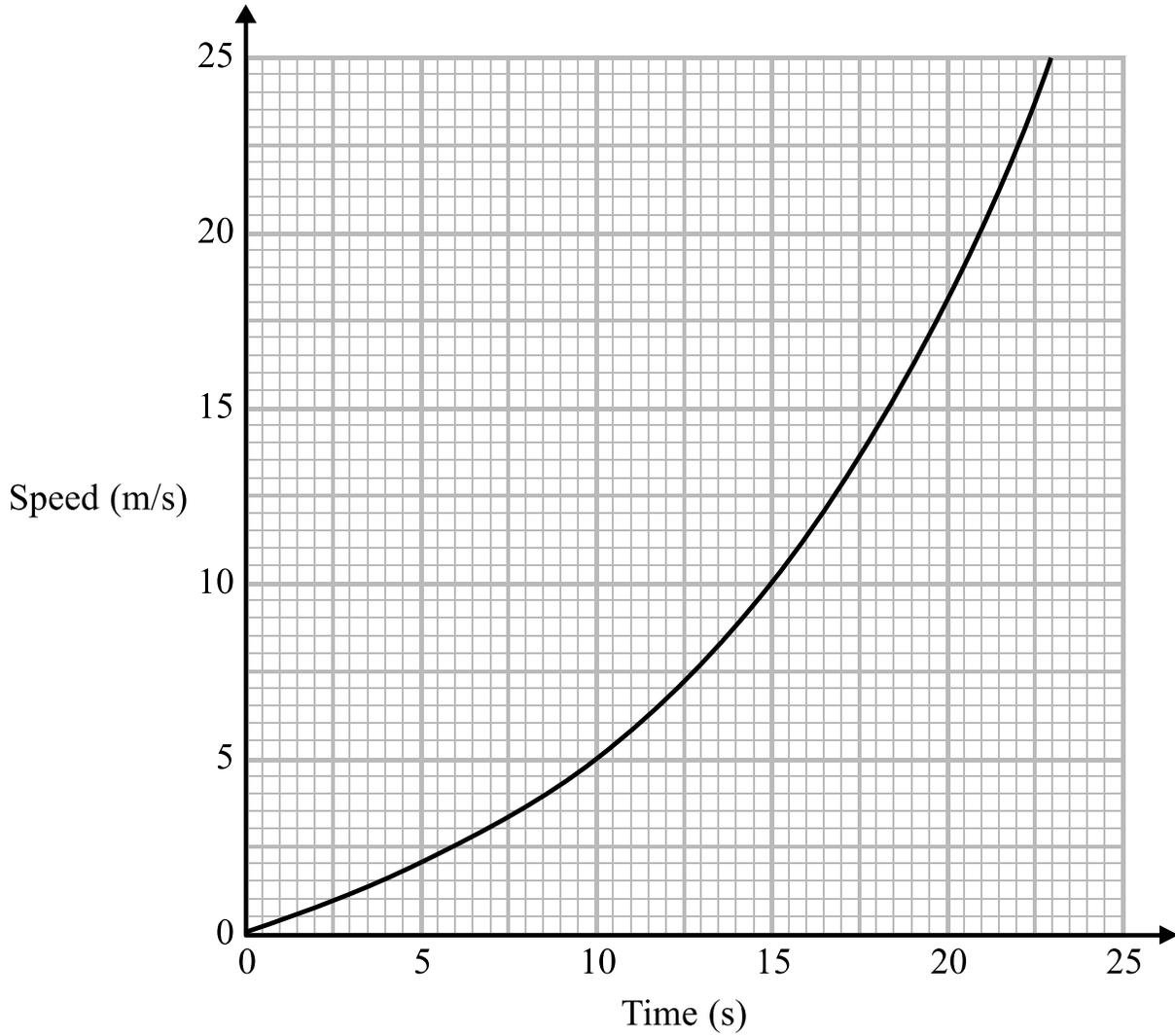Give a reason for your answer.

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**(2)**

(*b*)　　Work out this greatest speed.

............................................... m/s

**(1)**

**(Total 3 marks)**

**18.** Here is a speed-time graph for a train.



Work out an estimate for the distance the train travelled in the first 20 seconds.
Use 4 strips of equal width.

........................................................... m
**(Total 3 marks)**