NAME: _____          DATE: _____

1.    The table shows the scores of competitors in a competition.

| Score | 10 | 20 | 30 | 40 | 50 |
|---|---|---|---|---|---|
| Number of competitors with this score | 1 | 2 | 5 | $k$ | 3 |

The mean score is 34. Find the value of $k$.

**(Total 4 marks)**

2.    At a conference of 100 mathematicians there are 72 men and 28 women. The men have a mean height of 1.79 m and the women have a mean height of 1.62 m. Find the mean height of the 100 mathematicians.

**(Total 4 marks)**

3.    The four populations A, B, C and D are the same size and have the same range.
Frequency histograms for the four populations are given below.
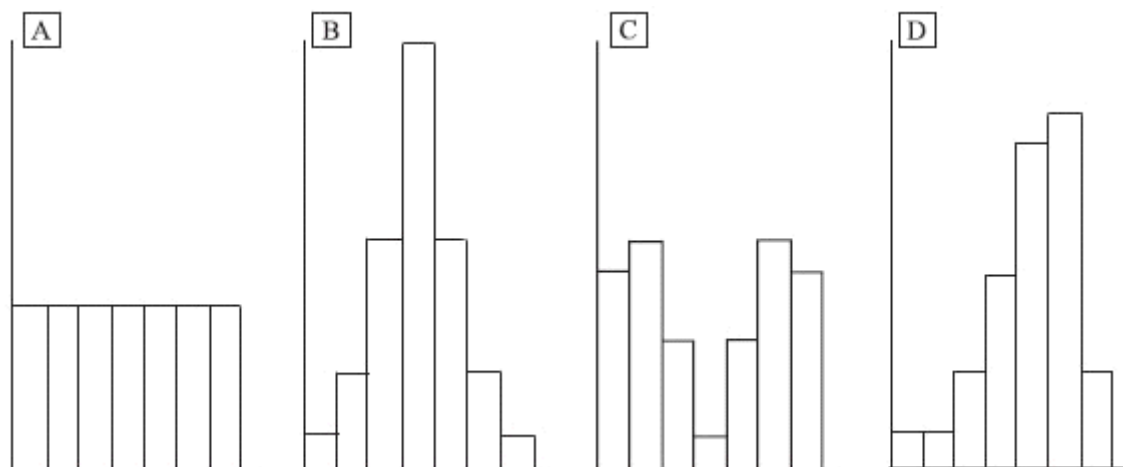


(a)    Each of the three box and whisker plots below corresponds to one of the four populations. Write the letter of the correct population under each plot.
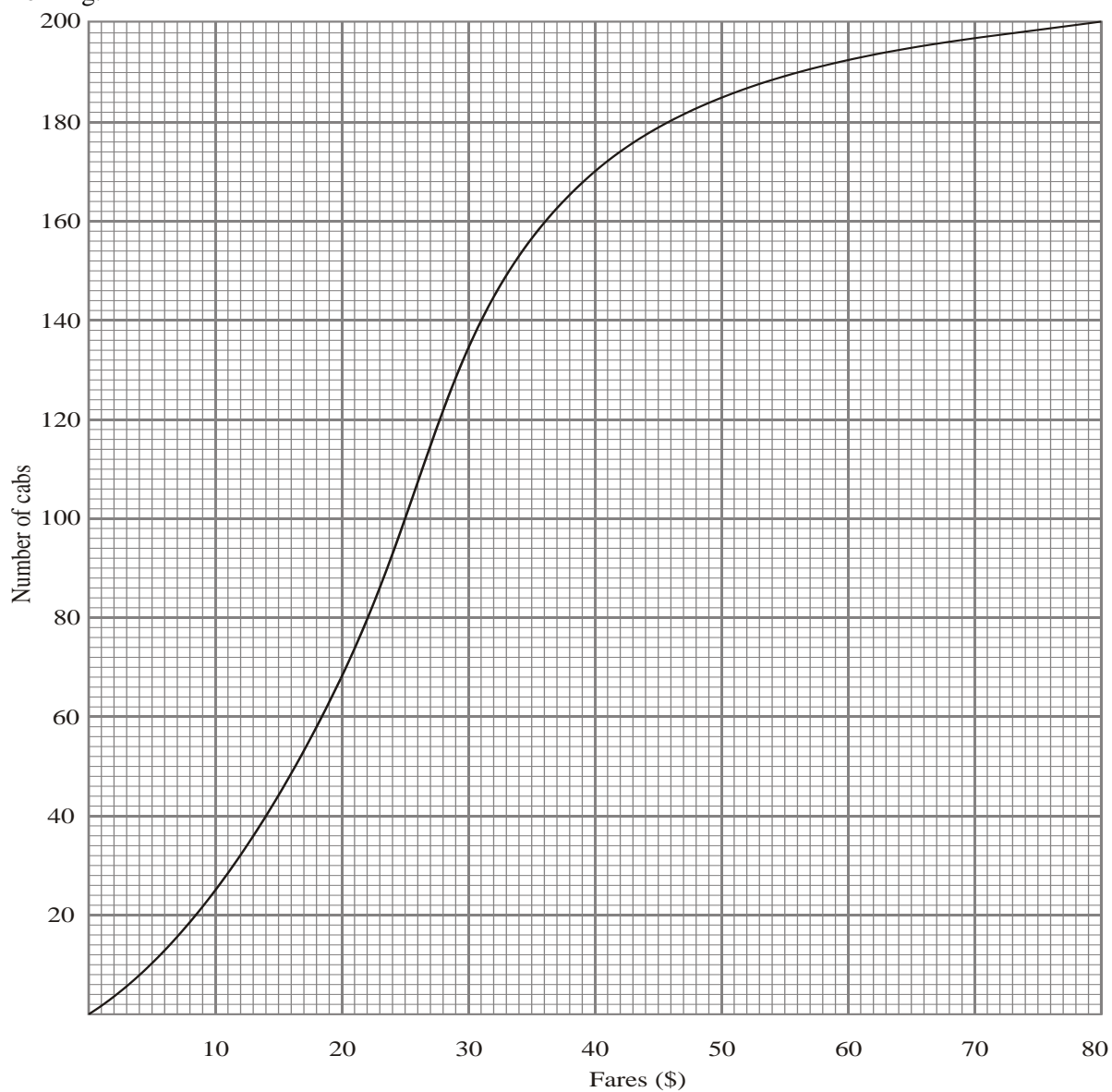


......                                        ......                                        ......
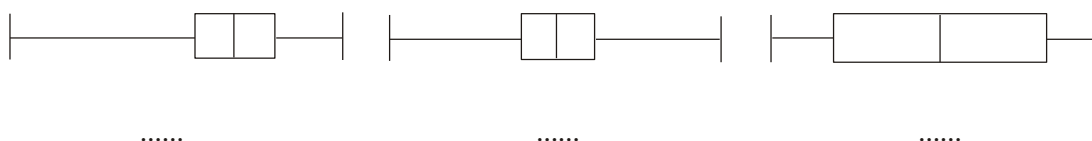
(b)   Each of the three cumulative frequency diagrams below corresponds to one of the four populations. Write the letter of the correct population under each diagram



.           ......                    ......                    ......
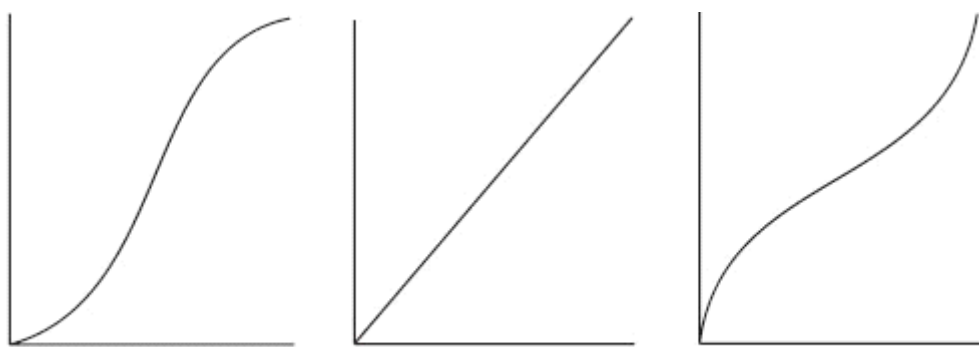
**(Total 6 marks)**

4.   A taxi company has 200 taxi cabs. The cumulative frequency curve below shows the fares in dollars ($) taken by the cabs on a particular morning.

(a)    Use the curve to estimate

   (i)    the median fare;

   (ii)    the number of cabs in which the fare taken is $35 or less.

**(2)**

The company charges 55 cents per kilometre for distance travelled. There are no other charges. Use the curve to answer the following.

(b)    On that morning, 40% of the cabs travel less than *a* km. Find the value of *a*.

**(4)**

(c)    What percentage of the cabs travel more than 90 km on that morning?

**(4)**
**(Total 10 marks)**

**5.**    One thousand candidates sit an examination. The distribution of marks is shown in the following grouped frequency table.

| Marks | 1–10 | 11–20 | 21–30 | 31–40 | 41–50 | 51–60 | 61–70 | 71–80 | 81–90 | 91–100 |
|---|---|---|---|---|---|---|---|---|---|---|
| Number of candidates | 15 | 50 | 100 | 170 | 260 | 220 | 90 | 45 | 30 | 20 |

(a)    **Copy** and complete the following table, which presents the above data as a cumulative frequency distribution.

**(3)**

| Mark | ≤10 | ≤20 | ≤30 | ≤40 | ≤50 | ≤60 | ≤70 | ≤80 | ≤90 | ≤100 |
|---|---|---|---|---|---|---|---|---|---|---|
| Number of candidates | 15 | 65 | | | | | 905 | | | |

(b)    Draw a cumulative frequency graph of the distribution, using a scale of 1 cm for 100 candidates on the vertical axis and 1 cm for 10 marks on the horizontal axis.

**(5)**

(c)    Use your graph to answer parts (i)–(iii) below,

   (i)    Find an estimate for the median score.

**(2)**

   (ii)    Candidates who scored less than 35 were required to retake the examination.
          How many candidates had to retake?

**(3)**

   (iii)    The highest-scoring 15% of candidates were awarded a distinction.
           Find the mark above which a distinction was awarded.

**(3)**
**(Total 16 marks)**

**6.** The following diagram represents the lengths, in cm, of 80 plants grown in a laboratory.
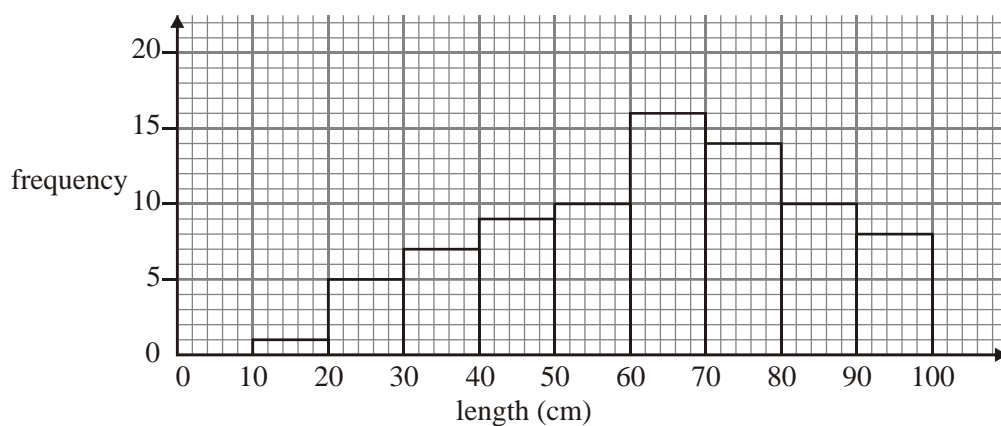


(a) How many plants have lengths in cm between

    (i) 50 and 60?

    (ii) 70 and 90?

**(2)**

(b) Calculate estimates for the mean and the standard deviation of the lengths of the plants.

**(4)**

(c) Explain what feature of the diagram suggests that the median is different from the mean.

**(1)**

(d) The following is an extract from the cumulative frequency table.

| length in cm less than | cumulative frequency |
|---|---|
| . | . |
| 50 | 22 |
| 60 | 32 |
| 70 | 48 |
| 80 | 62 |
| . | . |

Use the information in the table to estimate the median. Give your answer to **two** significant figures.

**(3)**
**(Total 10 marks)**