

STATISTICS (Q 7, PAPER 2)

LESSON NO. 6: CUMULATIVE FREQUENCY

2007

- 7 (b) The table below shows the time, in minutes, that customers were waiting to be served in a restaurant.

Time (minutes)	< 5	< 10	< 15	< 20	< 25
Number of customers	5	20	70	110	120

- Draw a cumulative frequency curve (ogive).
- Use your curve to estimate the median waiting time.
- Use your curve to estimate the interquartile range.

2006

- 7 (b) The number of new cars in various price ranges sold by a retailer in one month is recorded in the following table:

Price (€1000's)	10 – 15	15 – 20	20 – 25	25 – 30	30 – 50
Number sold	5	15	25	15	20

[Note: 15 – 20 means at least 15 but less than 20, etc.]

- Draw a histogram to represent the data.
- By taking the data at the mid-interval values, calculate the mean price per car.
- Copy and complete the following cumulative frequency table:

Price (€1000's)	< 15	< 20	< 25	< 30	< 50
Number sold					

- Draw the cumulative frequency curve (ogive).
- Using your curve, estimate how many of the cars sold were priced between the mean and the median.

2005

- 7 (c) A concert began at 8.00 p.m. The cumulative frequency table below gives the number of people in the concert hall at the times stated.

Time p.m.	7.10	7.20	7.30	7.40	7.50	8.00
Number of people	0	30	100	160	275	300

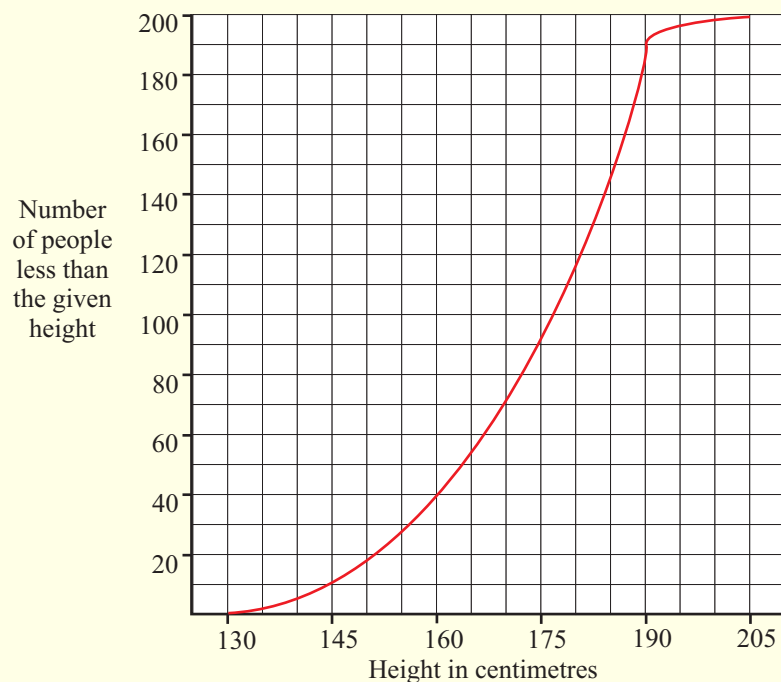
- (i) Copy and complete the following frequency table to show the number of people who entered the hall during each time interval.

Time interval	7.10 – 7.20	7.20 – 7.30	7.30 – 7.40	7.40 – 7.50	7.50 – 8.00
Number of people					

- (ii) In which interval does the median time of arrival lie?
- (iii) In which time interval did the greatest number of people enter the concert hall?
- (iv) What is the least number of people who could have been in the concert hall at 7.15 p.m?

2003

7 (a) The heights of 200 people are recorded to the nearest centimetre. The results are represented by the ogive below.



(i) Copy the cumulative frequency table below and use the ogive to complete it.

Height	<130	<145	<160	<175	<190	<205
Number of people	0					

(ii) Hence, copy and complete the following grouped frequency table:

Height	130 – 144	145 – 159	160 – 174	175 – 189	190 – 204
Number of people					

(iii) Using your grouped frequency table, and taking mid-interval values, find an estimate of the mean height.

(iv) Use the ogive to estimate the number of people who are taller than the mean.

2002

- 7 (b) The following cumulative frequency table refers to the ages of 70 guests at a wedding:

Age (in years)	< 20	< 40	< 60	< 90
Number of guests	6	23	44	70

- (i) Copy and complete the following frequency table:

Age (in years)	0 – 20	20 – 40	40 – 60	60 – 90
Number of guests				

[Note: 20 – 40 means 20 years old or more but less than 40 etc.]

- (ii) Using mid-interval values, calculate the mean age of the guests.
- (iii) What is the greatest number of guests who could have been over 65 years of age?

2001

- 7 (b) The following table shows the distribution of the amounts spent by 40 customers in a shop:

Amount Spent (IR£)	0 – 8	8 – 12	12 – 16	16 – 20	20 – 32
Number of Customers	2	9	13	10	6

[Note: IR£8 - IR£12 means IR£8 or over but less than IR£12 etc.]

- (i) Taking mid-interval values, estimate the mean amount spent by the customers.
- (ii) Copy and complete the following cumulative frequency table:

Amount Spent (IR£)	< 8	< 12	< 16	< 20	< 32
Number of Customers					

- (iii) Draw a cumulative frequency curve (ogive).
- (iv) Use your curve to estimate the number of customers who spent IR£25 or more.

2000

- 7 (c) The table below refers to the number of emergency calls recorded at a fire station each week for 52 weeks.

No. of emergency calls	0 – 10	11 – 20	21 – 30	31 – 40	41 – 50	51 – 60	61 – 70
Number of weeks	6	8	11	12	7	5	3

- (i) Copy and complete the following cumulative frequency table:

No. of emergency calls	≤ 10	≤ 20	≤ 30	≤ 40	≤ 50	≤ 60	≤ 70
Number of weeks	6						52

- (ii) Draw the cumulative frequency curve.
- (iii) Use your graph to estimate the interquartile range.
- (iv) Use your graph to estimate the number of weeks during which more than 56 emergency calls were recorded.

1999

- 7 (b) The cumulative frequency table below shows the distribution of ages of 110 people living in an estate.

Age in years	≤ 5	≤ 10	≤ 20	≤ 35	≤ 50	≤ 60
Number of people	5	15	40	90	105	110

- (i) Draw the cumulative frequency curve, putting number of people on the vertical axis.
- (ii) Use your curve to estimate the median age.
- (iii) Use your curve to estimate the number of people who are more than 15 years of age.

1997

- 7 (c) A new shop opened at 0900 hours. During the first hour of trading, customers were counted as they entered the shop. The following cumulative frequency table shows the number of customers who has entered before the given times:

Time	0910	0920	0930	0940	0950	1000
No. of customers	45	69	95	120	144	250

- (i) Draw a cumulative frequency curve.
- (ii) A photograph was taken of the 100th. customer as he or she entered the shop. Use your curve to estimate the time at which the photograph was taken.
- (iii) Use your curve to estimate the number of customers who entered the shop during the 15 minutes immediately after the photograph was taken.

1996

- 7 (b) The cumulative frequency table below shows the number of minutes taken by 80 people to complete a crossword:

Minutes	≤ 10	≤ 20	≤ 30	≤ 40	≤ 50	≤ 60
Cumulative Frequency	3	13	39	59	73	80

Draw a cumulative frequency curve.

Use your curve to estimate

- (i) the median time to complete the crossword
- (ii) the interquartile range.

ANSWERS

2007 7 (b) (ii) 14 mins (iii) 6 mins

2006 7 (b) (ii) €26,250

2005 7 (c) (i)

Time interval	7.10 – 7.20	7.20 – 7.30	7.30 – 7.40	7.40 – 7.50	7.50 – 8.00
Number of people	30	70	60	115	25

(ii) 7.30 – 7.40 (iii) 7.40 – 7.50 (iv) 0

2003 7 (a) (i)

Height	<130	<145	<160	<175	<190	<205
Number of people	0	10	40	90	190	200

(ii)

Height	130 – 144	145 – 159	160 – 174	175 – 189	190 – 204
Number of people	10	30	50	100	10

(iii) 172.25 (iv) 120

2002 7 (b) (i)

Age (in years)	0 – 20	20 – 40	40 – 60	60 – 90
Number of guests	6	17	21	26

(ii) 51 (iii) 26

2001 7 (b) (i) £15.40

(ii)

Amount Spent (IR£)	< 8	< 12	< 16	< 20	< 32
Number of Customers	2	11	24	34	40

2000 7 (c) (i)

No. of emergency calls	≤ 10	≤ 20	≤ 30	≤ 40	≤ 50	≤ 60	≤ 70
Number of weeks	6	14	25	37	44	49	52

(ii) 23 (iii) 5

1999 7 (b) (ii) 24 (iii) 84

1997 7 (c) (ii) 0932 (iii) 38

1996 7 (b) (i) 31 minutes (ii) 18 minutes