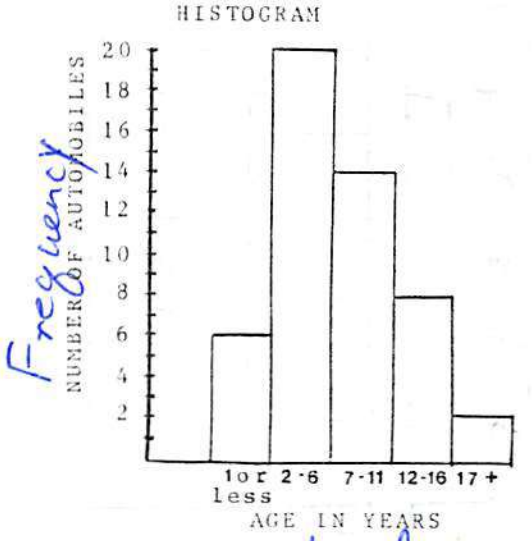
Frequency Histogram uses Intervals.

The following table represents the age in years of used automobiles advertised in a local daily newspaper:

Using the data in the Frequency column of the table, draw a histogram.



REMEMBER

Step 1. Draw and label a vertical axis to show NUMBER OF AUTOMOBILES. The scale starts at 0 and increases by 2 to include the largest value (frequency in any one interval.

Step 2. Draw and label a horizontal axis to show AGE IN YEARS intervals.

Step 3. Draw vertical bars for each interval. Note that there are no spaces between bars and the first bar is not touching the vertical axis. Each bar stops at its Frequency value.

Age Interval	Frequency
1 or less	6
2 - 6	20
7 - 11	14
12 - 16	8
17 or more	2

1. The following data represent the heights of 15 students in a certain class: 65, 58, 71, 63, 57, 66, 61, 60, 69, 56, 64, 73, 64, 68, 72

a. On your answer paper, copy and complete the table. [2]

Tally

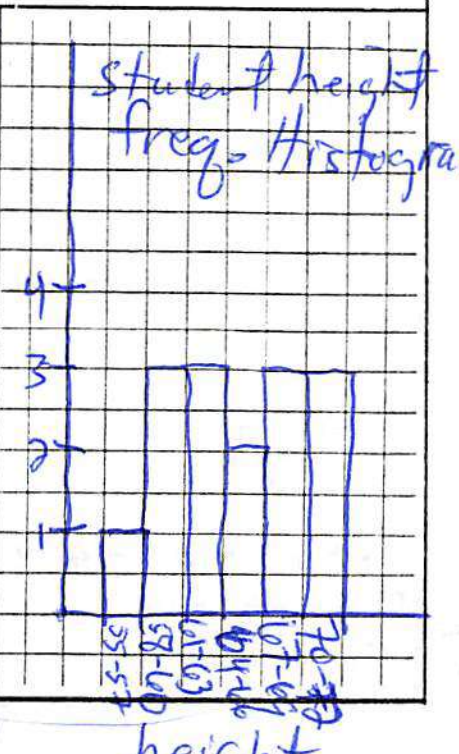
Interval	~~Number~~ (frequency)
55-57	I 1
58-60	II 3
61-63	III 3
64-66	II 2
67-69	III 3
70-72	III 3
	15

b. On graph paper, construct a frequency histogram based on the data. [6]

c. The median is contained in which interval? [2]

$\frac{15}{2} = 7.5 \approx 8^{th}$ piece of data (64-66)

$\frac{15}{4} = 3.75 \approx$ ~~8~~ (4th) 58-60 contains 1st Quartile.



Frequency Histogram (Continued)

2. The following data are test scores for a class of 20 students: 83, 91, 77, 88, 80, 62, 55, 92, 58, 96, 88, 60, 89, 100, 87, 64, 98, 88, 86, 70

a. On your answer paper, copy and complete the following table. [2]

Tally

Interval	Number	(frequency)
91-100	𝍸	5
81-90	𝍸 II	7
71-80	II	2
61-70	III	3
51-60	III	3
		20

b. On graph paper, construct a frequency histogram based on the data. [4]

c. Which interval contains the median? [2]

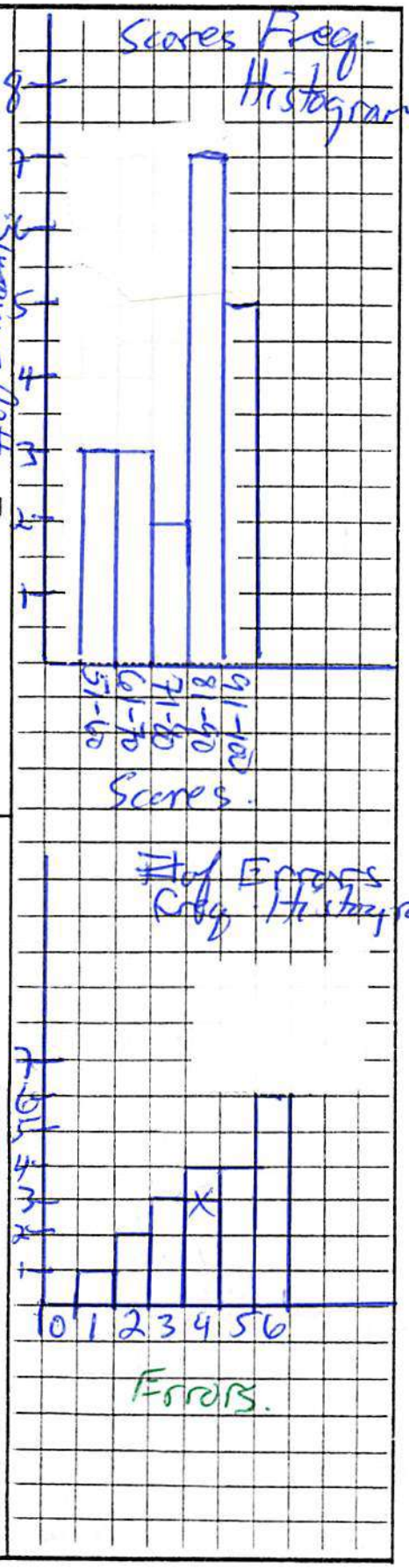
d. Which interval contains the lower quartile? [2]

c) $\frac{20}{2} = 10^{Th} + 11^{Th}$ pieces of data

81-90

d) $\frac{20}{4} = 5^{Th} + 6^{Th}$ pieces of data.

61-70



3. A class record showed the following number of grammatical errors in each of 20 term papers.

Errors	Frequency (Number of term papers)
0	0
1	1
2	2
3	3
4	4
5	4
6	6

# of Papers

a. On graph paper, construct a frequency histogram based on the data. [3]

b. Find the mean number of errors (to the nearest 10th)[3]

c. Find the median number of errors. [2] 4.5

d. Find the mode number of errors. [2] 6

b) 1+2+2+3+3+3+4+4+4+4+5+5+5+5+6+6+6+6+6+6

$\bar{X} = 4.3$

Frequency Histogram (Continued)

4. The following data represent the examination marks of 14 students in a certain class: 87, 69, 90, 71, 80, 84, 83, 81, 86, 90, 99, 89, 78, 69

a. On your answer paper, copy and complete the table. [2]

Tally

Interval	Number	(frequency)
65-73	III	3
74-82	III	3
83-91	IIII II	7
92-100	I	1

b. On graph paper, construct a frequency histogram based on the data. [6]

c. The median is contained in which interval? [2]

$\frac{14}{2} = 7^{th} + 8^{th}$ pieces of data.

83-91

Exam Scores Freq. Histogram

# of students

Scores

65-73 74-82 83-91 92-100

5. The table below gives the distribution of test scores for a class of 20 students.

Test Score Interval	Number of students (frequency)
91-100	1
81-90	2
71-80	8
61-70	5
51-60	4

a. Draw a frequency histogram for the given data. [4]

b. Which interval contains the median? [2]

c. Which interval contains the lower quartile? [2]

d. What is the probability that a student selected at random scored above 90? [2]

Cumulative Frequency Histogram

The following table represents the age in years of used automobiles advertised in a local daily newspaper:

Age Interval	Frequency	Cum. Freq.
1 or less	6	6
2 - 6	20	26
7 - 11	14	40
12 - 16	8	48
17 or more	2	50

Bad Intervals

a. Complete the Cumulative Frequency column.
b. Using the data in the Cumulative Frequency column of the table, draw a cumulative frequency histogram.
c. On the same set of axis as part b. above, draw a cumulative frequency polygon.
d. Use your results from part b. to answer the following questions:

(1) In which interval does the median lie?
(2) In which interval does the upper quartile lie?
(3) Which interval contains the lower quartile?

b. CUMULATIVE FREQUENCY HISTOGRAM (bars)

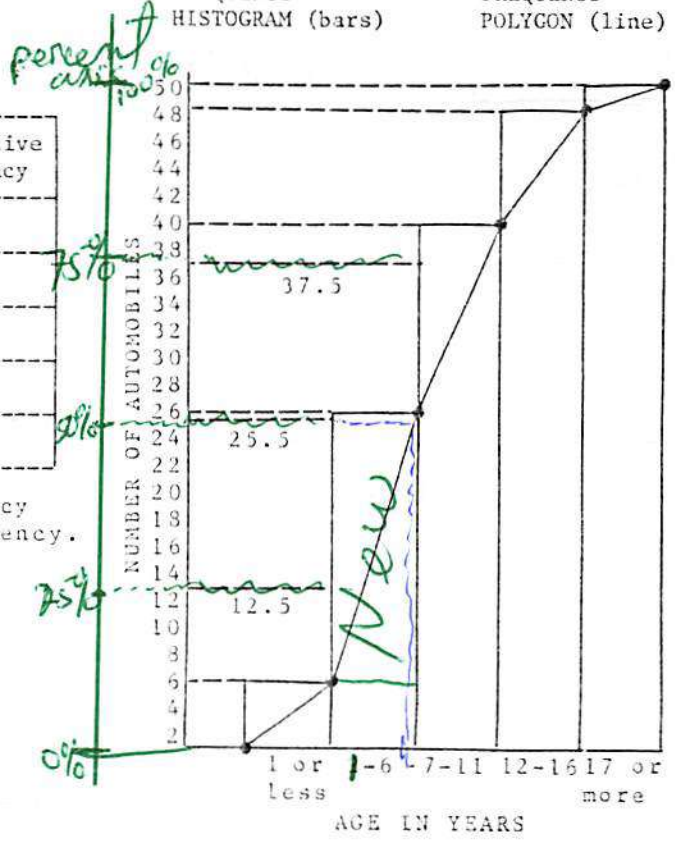
c. CUMULATIVE FREQUENCY POLYGON (line)

STATISTICS SOLUTION

a.

Age Interval	Frequency	Cumulative Frequency
1 or less	6	6
2 - 6	20	26
7 - 11	14	40
12 - 16	8	48
17 or more	2	50

Just keep adding the Frequency to find the Cumulative Frequency.



Cumulative frequency histogram polygon

d. 1. The median (50th percentile) is the measure where 1/2 of the automobiles are older and 1/2 are newer. Since there are 50 automobiles, the median is between 25 and 26. Looking at the cumulative frequency histogram in part b, a value between 25 and 26 falls in the interval 2 - 6.

2. The upper quartile (75th percentile) is the top 25%. Since there are 50 automobiles, 25% would be 12.5. If we subtract 50-12.5 the result of 37.5 can be seen in the interval 7-11.

3. The lower quartile (25th percentile), 12.5 can be seen in the interval 2-6.

Cumulative Frequency Histogram (Continued)

1. The table below shows the distribution of bowling scores.

Interval	Frequency	Cumulative Frequency
91-110	4	4
111-130	10	14
131-150	15	29
151-170	6	35
171-190	1	36
191-210	3	39
211-230	1	40

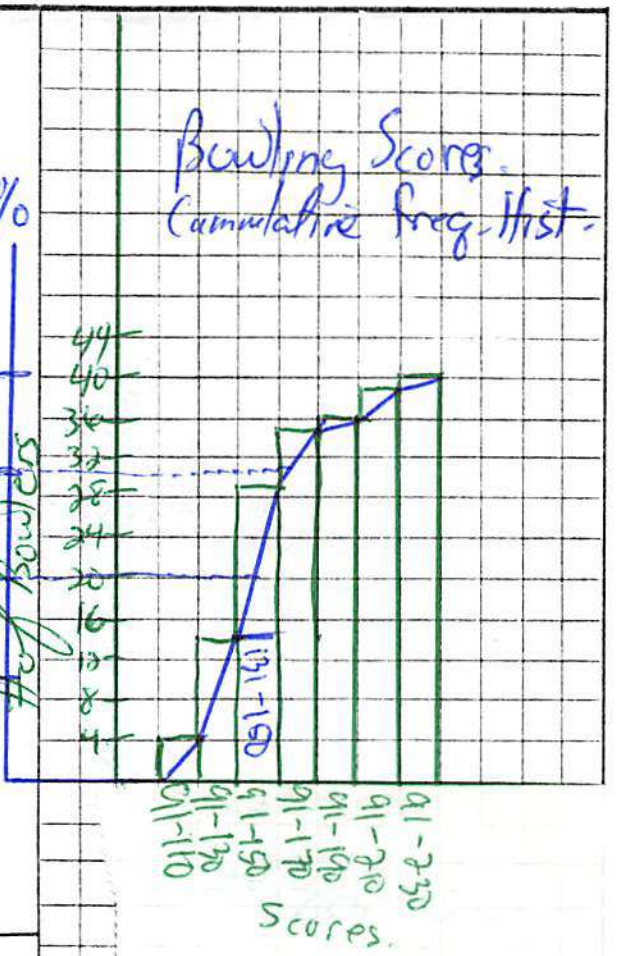
a. Complete the Cumulative Frequency column above. [2]

b. Using the data in the Cumulative Frequency column of the table, draw a cumulative frequency histogram. [4]

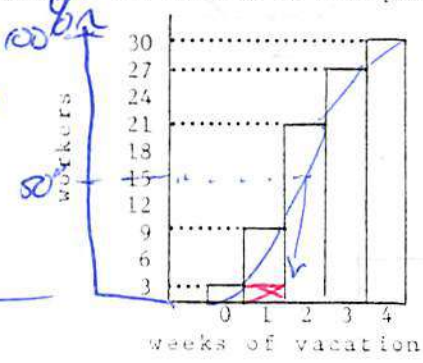
c. Use your results from part b to answer the following questions.

(1) In which interval does the median lie? [2] 131-150

(2) In which interval does the upper quartile lie? [2] 151-170



2. The cumulative frequency histogram below shows the number of weeks of annual vacation for workers at a company.



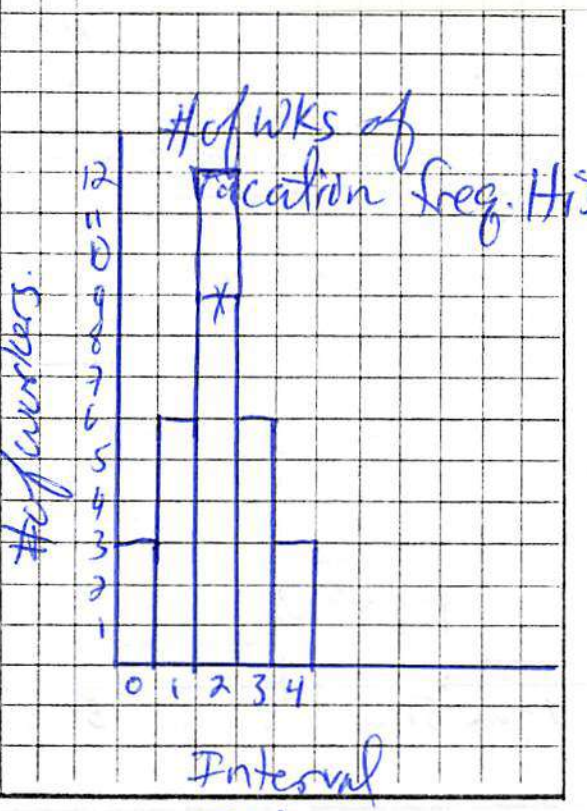
Int	Freq
0	3
1	6
2	12
3	6
4	3

a. How many workers are employed by the company? [2] 30

b. How many workers receive more than 2 weeks of vacation? [2] 9

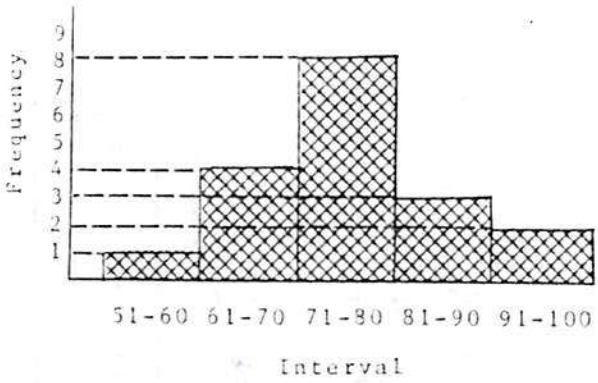
c. Find the median number of weeks of vacation. [2] 2 wks

d. Using the data from parts a, b, and c, draw a frequency histogram on your paper. [4]



Cumulative Frequency Histogram (Continued)

3. The frequency histogram below shows the distribution of scores on a science examination.



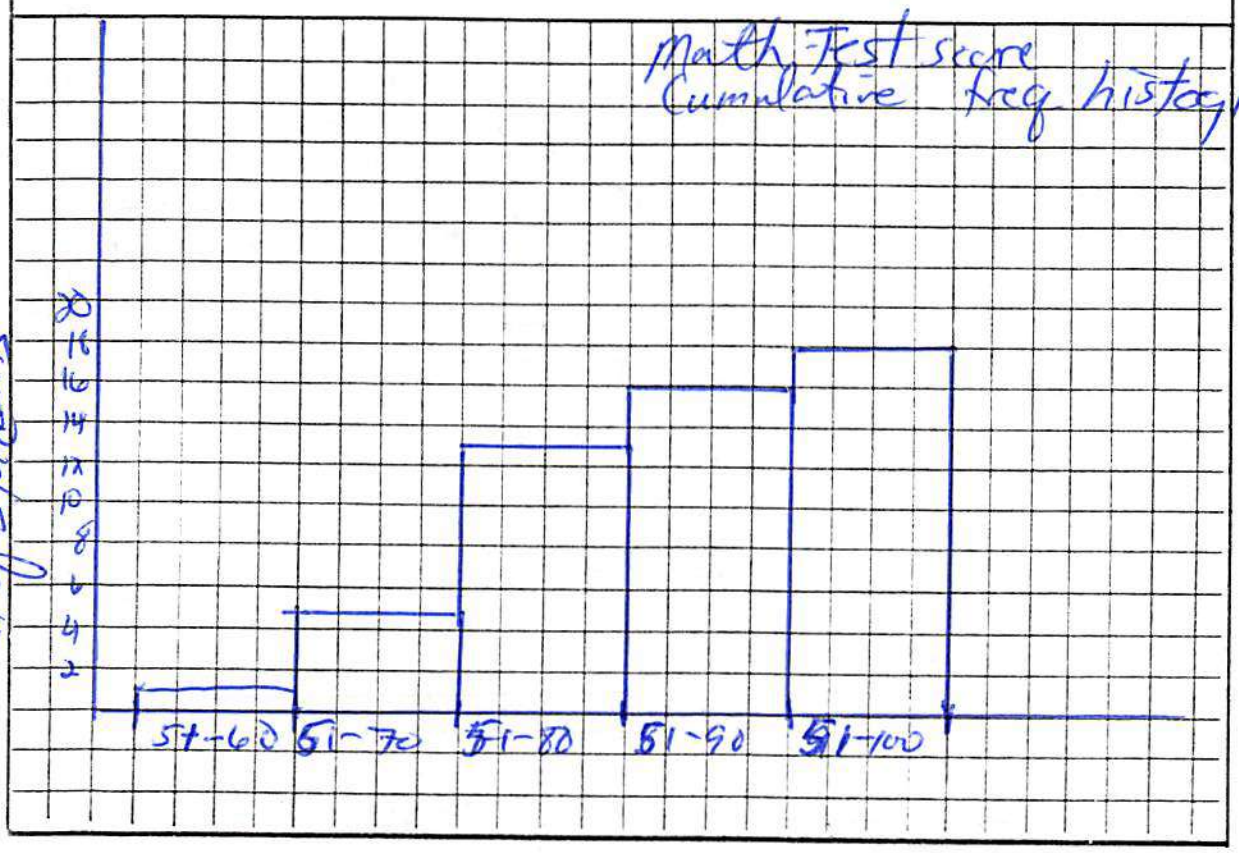
a. On your answer paper, copy and complete the table. [2]

b. How many students took the math test? [1] 18

c. How many students scored above 90? [2] 2

d. Using the table completed in part a, draw a cumulative frequency histogram. [4]

Scores	Frequency	Cumulative Frequency
51-60	1	1
61-70	4	5
71-80	8	13
81-90	3	16
91-100	2	18



Cumulative Frequency Histogram (Continued)

4. The points scored by the A-Team in twenty basketball games are 33, 27, 34, 30, 37, 32, 15, 23, 32, 29, 26, 30, 28, 31, 29, 35, 23, 30, 25, 30

a. Find the mode. (2) 30

b. On your answer paper, copy and complete the table below. (2)

Interval	Tally	Frequency	Cumulative Frequency
35-37	III	3	20
32-34	III	3	17
29-31	IIII II	7	14
26-28	III	3	7
23-25	IIII	4	4

c. Construct a cumulative frequency histogram based on the table completed in part b. (4)

d. In what interval does the median lie? (2)

5. The table below shows the distribution of scores of 20 students on a test.

Scores	Frequency	Cumulative Frequency
91-100	1	
81-90	8	
71-80	7	
61-70	3	
51-60	1	

a. Using the data in the Frequency column of the table, draw a frequency histogram. (4)

b. Complete the column for Cumulative Frequency. (2)

c. Using the data in the Cumulative Frequency column of the table, draw a cumulative frequency histogram. (4)