

Histograms

09 January 2020 10:20

Note : Bar charts each bar has a space between them - This is DISCRETE Data - specific value

Histogram will have NO SPACES between the bars - This is continuous data. - measured on a scale

In a histogram the data is grouped
The group is called a class



T&T2h 13.3
Histograms



T&T2h 13.3
Histogram...

Section 13.3 Histograms

Example 1

Fifty children were asked to solve a puzzle.

The table below records the time, in minutes, taken by the children.

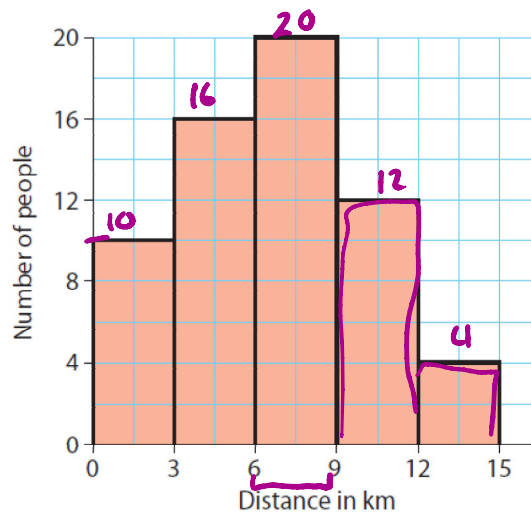
Time (in mins)	0–5	5–10	10–15	15–20	20–25
Number of children	6	10	16	12	6

Draw a histogram to illustrate this data.



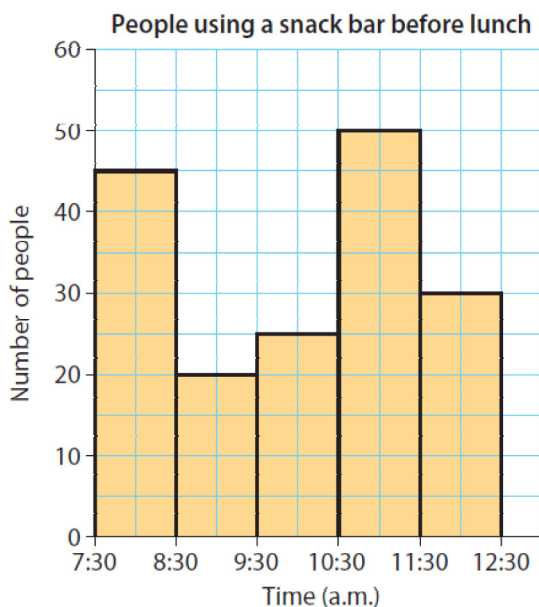
Exercise 13.3

1. The histogram on the right shows the distances, in kilometres, travelled to work by people in an office block.



- (i) How many people travelled between 6 km and 9 km to work? **20 people**
- (ii) How many people had to travel more than 9 km? **$12 + 4 = 16$**
- (iii) What is the modal class? **6-9 - most common**
- (iv) What is the total number of people included in the survey? **$10 + 16 + 20 + 12 + 4 = 62$**

2. The histogram shows the number of people who used a snack bar before lunch one weekday.



- (i) At what time do you think the snack bar opened?
- (ii) How many people used the snack bar during the first hour?
- (iii) Why do you think that the people used the snack bar at this time?

The snack bar had another busy hour.

- (iv) When was it busy again?
- (v) Why do you think that the snack bar was busy for a second time?

3. A Garda officer recorded the speeds of cars passing a school.

The table below shows the speeds that he recorded.

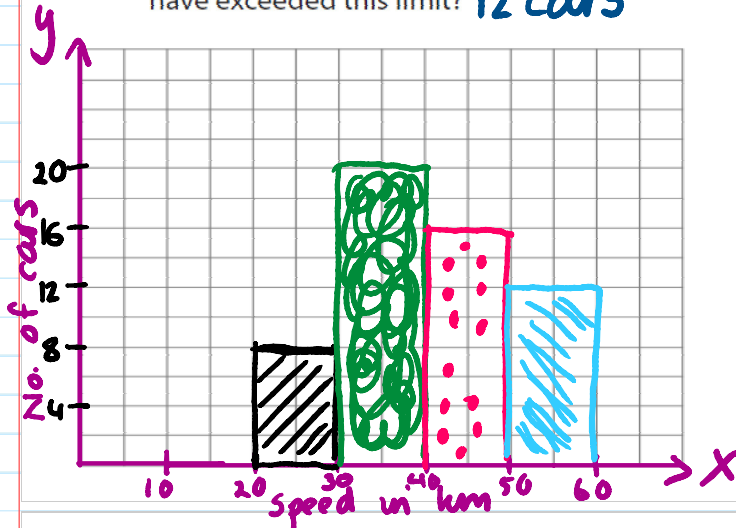
Speed (in km)	20-30	30-40	40-50	50-60
Number of cars	8	20	16	12

y axis ↑ → frequency.
 x axis → will be the classes

(i) Draw a histogram to illustrate this data.

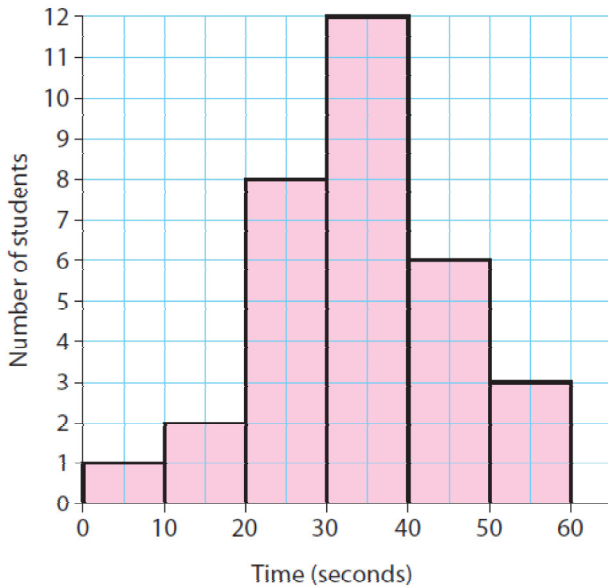
(ii) How many cars were travelling at less than 40 km/hour? $16 + 12 = 28$

(iii) If the speed limit was 55 km/hr, what is the maximum number of cars that could have exceeded this limit? **12 cars**



C/W
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4. The histogram below shows the times taken by a group of students to solve a problem.



- (i) How many students were in the group?
- (ii) Write down the modal class.
- (iii) What percentage of students took between 20 seconds and 30 seconds to solve the problem?

- (iv) What is the greatest number of students who could have solved the problem in less than 35 seconds?

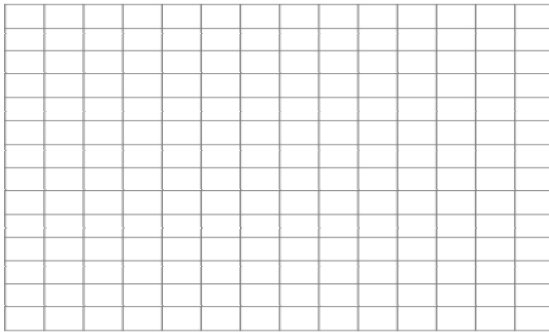
- (v) If a student is selected at random, what is the probability that the student took longer than 40 seconds to solve the problem?

5. At the end of their journeys, 30 motorists were asked how many kilometres they had travelled. Their responses are shown in the table below:

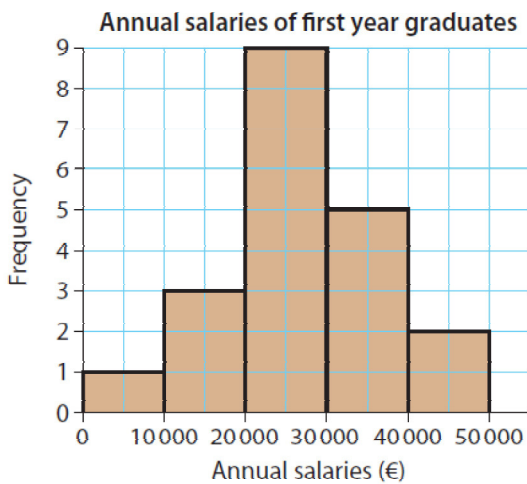
Distance (in km)	0–20	20–40	40–60	60–80	80–100
Frequency	6	12	7	4	1

[0–20 means ≥ 0 and < 20]

- Draw a histogram to illustrate this data.
- How many motorists had travelled 40 km or more?
- What is the modal class?
- If the median is the value that is halfway into the distribution, in which interval does the median lie?
- Use the mid-interval values to estimate the mean of the distribution.

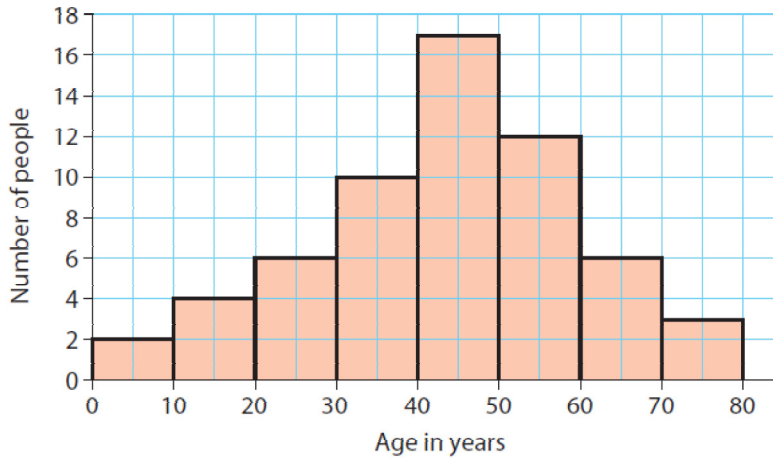


6. The histogram opposite shows the annual salaries of a group of graduates in their first year of employment.



- How many graduates earned more than €40 000?
 - What is the modal class for the salaries?
 - What is the greatest number of graduates who could have earned more than €35 000?
 - How many graduates were surveyed?
- (v) If a graduate was selected at random from the group, what is the probability that he/she earned between €10 000 and €20 000?

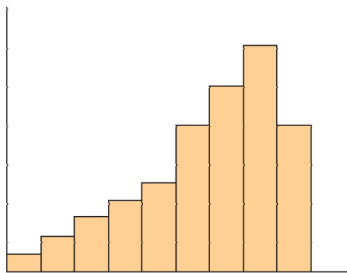
7. The histogram below shows the ages of people living in a village.



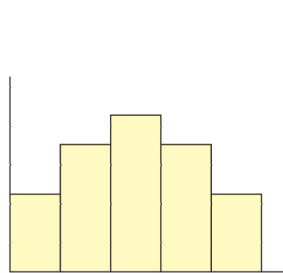
- How many people are aged under 30 years?
- How many people live in the village?
- Which interval contains 20% of the people?
- If a person is selected at random, what is the probability that he/she is aged between 60 and 70 years?
- What is the greatest number of people who could be older than 55 years?
- Use the mid-interval values to find an estimate of the mean age.

8. Here are three distributions

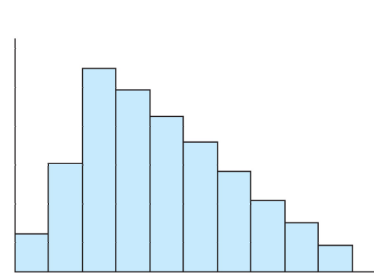
(A)



(B)



(C)



- Which of these distributions is symmetrical?
- Which distribution is positively skewed?
- Which distribution is negatively skewed?

Answers

Exercise 13.3

1. (i) 20 (ii) 16
(iii) (6–9) km (iv) 62
2. (i) 7.30 am
(ii) 45
(iii) Breakfast
(iv) 10.30 am–11.30 am
(v) Elevenses
3. (ii) 28 (iii) 12
4. (i) 32 (ii) (30–40) sec
(iii) 25% (iv) 23 (v) $\frac{9}{32}$
5. (ii) 12 (iii) (20–40) km
(iv) (20–40) km (v) 38 km
6. (i) 2 (ii) (€20 000–€30 000)
(iii) 7 (iv) 20 (v) $\frac{3}{20}$
7. (i) 12 (ii) 60 (iii) (50–60) yrs
(iv) $\frac{1}{10}$ (v) 21 (vi) $43\frac{1}{2}$ yrs
8. (i) (B) (ii) (C) (iii) (A)