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Frequency Distributions

SOL 8.12

Example

The number of eighth-grade students at Tyler Middle School that were absent each day during the last four school weeks is shown below.

6, 4, 3, 8, 4, 5, 5, 8, 6, 4,
6, 3, 5, 7, 8, 8, 6, 8, 7, 5

What is the relative cumulative frequency for 5 eighth-grade students being absent?

- A 20%
 B 45%
 C 55%
 D 80%

Thinking It Through

Solve — *List It* Make a tally table of the data.

Use the tally table to make a frequency table that includes the relative frequency, cumulative frequency, and relative cumulative frequency.

The *cumulative frequency* is the sum of a frequency and the frequencies before it.

The *relative cumulative frequency* is the percent for a frequency added to the percent for all the frequencies before it.

Number	Tally
3	
4	
5	
6	
7	
8	

Students Absent	Frequency	Relative Frequency	Cumulative Frequency	Relative Cumulative Frequency
3	2	10%	2	10%
4	3	15%	5	25%
5	4	20%	9	45%
6	4	20%	13	65%
7	2	10%	15	75%
8	5	25%	20	100%

The relative cumulative frequency of 5 students being absent is 45%, answer B.

Review

- The **frequency** of a data set is the number of times a score appears in a data set. In the *Example*, 3 occurs twice, so the frequency is 2.
- The **relative frequency** is the percent that the frequency appears in the data set. There are 20 pieces of data in the set. If the frequency of 3 is 2, then the relative frequency is $\frac{2}{20} = 10\%$.
- The **cumulative frequency** is the number of scores that fall *at or below* another score when ordered from least to greatest. 5 occurs 4 times; 4 occurs 3 times; 3 occurs 2 times; the cumulative frequency of 5 is $4 + 3 + 2 = 9$.
- The **relative cumulative frequency** is the percent of scores that fall *at or below* another score when ordered from least to greatest. The relative cumulative frequency for 5 is $\frac{9}{20} = 45\%$.

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DIRECTIONS Read and solve each question. Then circle the letter of the best answer.

Use the data to answer questions 1–4.

The scores from the last math quiz in Mr. Miller’s class are listed below.

75, 90, 85, 90, 100, 75, 80, 95,
90, 85, 80, 75, 90, 95, 100, 75

1 What is the relative frequency of scoring an 80?

- A 12.5%
- B 18.75%
- C 25%
- D 31.25%



You can find the relative frequency by setting the number of times a given score occurs as the numerator over a denominator of the total number of scores.

2 What is the cumulative frequency of scoring an 85?

- F 2
- G 6
- H 8
- J 16

3 What is the relative cumulative frequency of scoring a 90?

- A 25%
- B 50%
- C 62.5%
- D 75%

4 Which sentence about the relative cumulative frequency is true?

- F The relative cumulative frequency will always be 100% for the greatest value of a data set.
- G The relative cumulative frequency will always equal the relative frequency of the least value of a data set.
- H The least value in a data set always has the least relative cumulative frequency.
- J The relative cumulative frequency is always greater than the relative frequency.