

**Question 1 (8 points)**

Computing Percentiles. Consider a sample with data values of 27, 25, 20, 15, 30, 34, 28, and 25. Compute the 20th, 25th, 65th, and 75th percentiles. LO 10

20th percentile

25th percentile

65th percentile

75th percentile



To compute percentiles, follow these steps:

Step 1: Sort the data in ascending order

Original values:

27, 25, 20, 15, 30, 34, 28, 25



Sorted data:

15, 20, 25, 25, 27, 28, 30, 34

(n = 8 values)

Step 2: Use the Percentile Rank Formula

Percentile rank position (P^k) = $(k/100) \times (n + 1)$

Where:

- k = desired percentile

- n = number of data points

Let's compute the positions:

1. 20th Percentile

$$P(20) = (20/100) \times (8 + 1) = 0.20 \times 9 = 1.8$$



This lies between the 1st and 2nd values:

$$\rightarrow 1^{\text{st}} = 15$$

$$\rightarrow 2^{\text{nd}} = 20$$

Interpolate:

$$= 15 + 0.8 \times (20 - 15) = 15 + 4 = 19$$

2. 25th Percentile

$$P(25) = (25/100) \times (8 + 1) = 0.25 \times 9 = 2.25$$

Between 2nd (20) and 3rd (25):

$$= 20 + 0.25 \times (25 - 20) = 20 + 1.25 = 21.25$$

3. 65th Percentile

$$P(65) = 0.65 \times 9 = 5.85$$

Between 5th (27) and 6th (28):

$$= 27 + 0.85 \times (28 - 27) = 27 + 0.85 = 27.85$$



4. 75th Percentile

$$P(75) = 0.75 \times 9 = 6.75$$

Between 6th (28) and 7th (30):

$$= 28 + 0.75 \times (30 - 28) = 28 + 1.5 = 29.5$$

✓ **Final Answers:**

- 20th percentile: 19
- 25th percentile: 21.25
- 65th percentile: 27.85
- 75th percentile: 29.5



frequency distribution is given. LO 3

CLASS rELATIVE FREQUENCY

A 0.22

B 0.18

C 0.40

D

What is the relative frequency of the class D?

The total sample size is 200. What is the frequency of class D? 2.

Show the frequency distribution.

Show the precent frequencyy distribution.

CLASS RELATIVE REQUENCY FREQUENCY % OF
FREQUENCY

A

B

C

D



TOTAL

Let's break this down step by step:

Step 1: Find the Relative Frequency of Class D

Given:

- Class A: 0.22
- Class B: 0.18
- Class C: 0.40
- Total relative frequency must equal 1.00

So:

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= 1.00 - 0.80
= **0.20**
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Step 2: Compute the Frequency (Count) of Each Class

Given: Total sample size = 200

Use formula:

Frequency = Relative Frequency × Total Sample Size

CLASS	RELATIVE FREQUENCY	FREQUENCY
A	0.22	0.22 × 200 = 44
B	0.18	0.18 × 200 = 36
C	0.40	0.40 × 200 = 80
D	0.20	0.20 × 200 = 40
TOTAL	1.00	200

Step 3: Compute the Percent Frequency

Use formula:

$$\text{Percent Frequency} = \text{Relative Frequency} \times 100\%$$

CLASS	RELATIVE FREQUENCY	FREQUENCY	% OF FREQUENCY
A	0.22	44	22%
B	0.18	36	18%
C	0.40	80	40%
D	0.20	40	20%
TOTAL	1.00	200	100%



- Relative frequency of D: 0.20
- Frequency of class D: 40
- Frequency Distribution & Percent Frequency shown in table above.



Computing Mean, Median, and Mode. Consider a sample with data values of 53, 55, 70, 58, 64, 57, 53, 69, 57, 68, and 53. Compute the mean, median, and mode. LO 8

Mean

Median

Let's compute the **mean**, **median**, and **mode** for the data set:



Given Data:

53, 55, 70, 58, 64, 57, 53, 69, 57, 68, 53

✓ Step 1: Mean

Formula:

$$\text{Mean} = \frac{\text{Sum of all values}}{\text{Number of values}}$$

Sum = $53 + 55 + 70 + 58 + 64 + 57 + 53 + 69 + 57 + 68 + 53 = 657$

Number of values = 11

$$\text{Mean} = \frac{657}{11} = 59.73$$

✓ Step 2: Median



1. Sort the data:

53, 53, 53, 55, 57, 57, 58, 64, 68, 69, 70

2. Number of values = 11 (odd, so median is the middle value)

Middle position = $(11 + 1) / 2 = 6\text{th value}$

Median = 57

✓ Step 3: Mode

The **mode** is the value that appears most frequently.

From the data:

- 53 appears **3 times**
- 57 appears **2 times**
- Others appear once

Mode = 53




Final Answers:

- **Mean:** 59.73
- **Median:** 57
- **Mode:** 53



Computing Mean and Median. Consider a sample with data values of 10, 20, 12, 17, and 16. LO 8

a. Compute the mean and median. 1. mean and 2. median

b. Consider a sample with data values 10, 20, 12, 17, 16, and 12. How would you expect the mean and median for these sample data to compare to the mean and median for part a (high , lower, or the same)? Compute the

and 12.

New mean and new median

Let's solve this step by step.

a. Original data: 10, 20, 12, 17, 16

1. ☒ Mean

$$\text{Mean} = \frac{10 + 20 + 12 + 17 + 16}{5} = \frac{75}{5} = \boxed{15}$$

2. ☒ Median

Sorted data: 10, 12, 16, 17, 20

Middle value (3rd) = 16

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Median = 16

b. New data: 10, 20, 12, 17, 16, 12

You've added another 12, making the data:

10, 20, 12, 17, 16, 12

Predict:

- Mean might go **slightly down** (added a value lower than the original mean)
- Median might also go **slightly down**, depending on how the data is centered.

☒ New Mean

$$\text{Mean} = \frac{10 + 20 + 12 + 17 + 16 + 12}{6} = \frac{87}{6} = \boxed{14.5}$$

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☒ New Median

Sorted data: 10, 12, 12, 16, 17, 20

Median = average of 3rd and 4th values = $(12 + 16)/2 = 14$

$$\text{Median} = \boxed{14}$$

Summary:

	Mean	Median
Original	15	16
New (w/ 12)	14.5	14
Comparison	Lower	Lower



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Question 6 (10 points)

Wall Street Journal Subscriber Characteristics. A Wall Street Journal subscriber survey asked 46 questions about subscriber characteristics and interests. State whether each of the following questions provides categorical or quantitative data. Just type in categorical or quantitative. LO 1

- What is your age?
- Are you male or female?
- When did you first start reading the WSJ? High

school, college, early career, midcareer, late career, or retirement?

d. How long have you been in your present job or position?

e. What type of vehicle are you considering for your next purchase? Nine response categories include sedan, sports car, SUV, minivan, and so on.

Here are the correct classifications for each question:

a. What is your age?

→ **Quantitative** (because age is a numerical measurement)

b. Are you male or female?

→ **Categorical** (because it describes a category or group)

c. What type of education did you complete?

d. How long have you been in your present job or position?

→ **Quantitative** (it's measured in time, a numerical value)

e. What type of vehicle are you considering for your next purchase?

→ **Categorical** (vehicle types are categories)

✓ Final Answers:

a. Quantitative

b. Categorical

c. Categorical

d. Quantitative

e. Categorical



Ask anything



Tools



ChatGPT can make mistakes. Check important info.