

5.1 Mean

Answers

1. C

$$\bar{x} = \frac{\sum x_1 + x_2 + x_3 + \dots + x_n}{n}$$

$$\bar{x} = \frac{10 + 39 + 71 + 42 + 39 + 76 + 38 + 25}{8}$$

$$\bar{x} = \frac{340}{8}$$

$$\bar{x} = 42.5$$

2. D The population mean is denoted by “mu,” and its symbol is μ .

3. B The mean is calculated by dividing the sum of all values by the number of values.

4. A $71.5 \times 4 = 286$ $286 - (58 + 76 + 88) = 64$

5. The means can be calculated as follows:

a.

$$\bar{x} = \frac{20 + 14 + 54 + 16 + 38 + 64}{6}$$

$$\bar{x} = \frac{206}{6}$$

$$\bar{x} = 34.33$$

b.

$$\bar{x} = \frac{22 + 51 + 64 + 76 + 29 + 22 + 48}{7}$$

$$\bar{x} = \frac{312}{7}$$

$$\bar{x} = 44.57$$

c.

$$\bar{x} = \frac{40 + 61 + 95 + 79 + 9 + 50 + 80 + 63 + 109 + 42}{10}$$

$$\bar{x} = \frac{628}{10}$$

$$\bar{x} = 62.8$$

6. 171.6 pounds $167.2 \times 5 = 836$ $836 - (158.4 + 162.8 + 165.0 + 178.2) = 171.6$

$$6. \quad 171.6 \text{ pounds} \quad 107.2 \times 5 = 856 \quad 856 - (158.4 + 162.8 + 165.0 + 178.2) = 171.6$$

7. The answers can be calculated as follows:

a. $12 \times 5.1 = 61.2$ feet

b. $8 \times 4.8 = 38.4$ feet

c. $61.2 + 38.4 = 99.6$ feet. feet

8. 31.0 advertisements

$$\bar{x} = \frac{43 + 37 + 35 + 30 + 41 + 23 + 33 + 31 + 16 + 21}{10}$$

$$\bar{x} = \frac{310}{10}$$

$$\bar{x} = 31.0$$

9. The means can be calculated as follows:

a.

$$\bar{x} = \frac{90 + 50 + 70 + 80 + 70}{5}$$

$$\bar{x} = \frac{360}{5}$$

$$\bar{x} = 72$$

b.

$$\bar{x} = \frac{60 + 20 + 30 + 80 + 90 + 20}{6}$$

$$\bar{x} = \frac{300}{6}$$

$$\bar{x} = 50$$

c.

$$\bar{x} = \frac{90 + 50 + 70 + 80 + 70 + 60 + 20 + 30 + 80 + 90 + 20}{11}$$

$$\bar{x} = \frac{660}{11}$$

$$\bar{x} = 60$$

10. The answers can be calculated as follows:

a. $31 \times 4 = 124$

b.

$$\bar{x} = \frac{124 + (6 \times 28)}{10}$$

$$\bar{x} = \frac{124 + 168}{10}$$

$$\bar{x} = \frac{292}{10}$$

$$\bar{x} = 29.2$$

11. The means can be calculated as follows:

a.

$$\bar{x} = \frac{22 + 19 + 26 + 18 + 29 + 33 + 20 + 16 + 30}{9}$$

$$\bar{x} = \frac{213}{9}$$

$$\bar{x} = 23.67 \text{ pounds}$$

b.

$$\bar{x} = \frac{22 + 19 + 26 + 18 + 29 + 20 + 30}{7}$$

$$\bar{x} = \frac{164}{7}$$

$$\bar{x} = 23.43 \text{ pounds}$$

12. a. No Melanie's answer is not correct. The temperature of 0°C was recorded, but she did not include

it in the total.

$$\bar{x} = \frac{-7 + 0 + -1 + 1 + -4 + -6 + 3}{7}$$

$$\bar{x} = \frac{-14}{7}$$

$$\bar{x} = -2^\circ\text{C}$$

b. She divided the sum of the numbers by 6, but she should have divided by 7. The mean daily temperature should be -2°C .

13. The means can be calculated as follows:

$$\bar{x} = \frac{\sum x_1 + x_2 + x_3 + \dots + x_n}{n}$$

$$\bar{x} = \frac{93 + 78 + 84 + 106 + 116 + 93 + 90 + 75 + 104 + 100 + 123 + 57}{12}$$

$$\bar{x} = \frac{1119}{12}$$

$$\bar{x} = 93.25 \text{ (Honest Hoopers)}$$

$$\bar{x} = \frac{\sum x_1 + x_2 + x_3 + \dots + x_n}{n}$$

$$\bar{x} = \frac{110 + 89 + 91 + 121 + 84 + 79 + 114 + 66 + 50 + 101 + 106 + 114}{12}$$

$$\bar{x} = \frac{1125}{12}$$

$$\bar{x} = 93.75 \text{ (Bouncy Baskets)}$$

The Bouncy Baskets had the higher mean score.

5.2 Ungrouped Data to Find the Mean

Answers

1. The mean can be calculated as follows:

$$\bar{x} = \frac{\sum(0)(6) + (1)(9) + (2)(8) + (3)(9) + (4)(2) + (5)(3) + (6)(2) + (7)(5) + (8)(1)}{6 + 9 + 8 + 9 + 2 + 3 + 2 + 5 + 1}$$

$$\bar{x} = \frac{\sum 0 + 9 + 16 + 27 + 8 + 15 + 12 + 35 + 8}{45}$$

$$\bar{x} = \frac{130}{45}$$

$$\bar{x} = 2.89$$

2. The mean can be calculated as follows:

$$\bar{x} = \frac{\sum(0)(11) + (1)(10) + (2)(6) + (3)(9) + (4)(6) + (5)(5) + (6)(8) + (7)(5) + (8)(5) + (9)(3) + (10)(2)}{11 + 10 + 6 + 9 + 6 + 5 + 8 + 5 + 5 + 3 + 2}$$

$$\bar{x} = \frac{\sum 0 + 10 + 12 + 27 + 24 + 25 + 48 + 35 + 40 + 27 + 20}{70}$$

$$\bar{x} = \frac{268}{70}$$

$$\bar{x} = 3.83$$

3. The frequency distribution table is as follows:

TABLE 5.1:

Number of Siblings	Tally of Number of Siblings	Number of Students (Frequency)
0		6
1		9
2		6
3		5
4		4
5		1
6		1

The mean can be calculated as follows:

$$\bar{x} = \frac{\sum(0)(6) + (1)(9) + (2)(6) + (3)(5) + (4)(4) + (5)(1) + (6)(1)}{6 + 9 + 6 + 5 + 4 + 1 + 1}$$

$$\bar{x} = \frac{\sum 0 + 9 + 12 + 15 + 16 + 5 + 6}{32}$$

$$\bar{x} = \frac{63}{32}$$

$$\bar{x} = 1.97$$

4. The frequency distribution table is as follows:

TABLE 5.2:

Number of Touchdowns	Tally of Number of Touchdowns	Number of Teams (Frequency)
0		2
1		3
2		7
3		7
4		8
5		3
6		0
7		1
8		1

The mean can be calculated as follows:

$$\bar{x} = \frac{\sum(0)(2) + (1)(3) + (2)(7) + (3)(7) + (4)(8) + (5)(3) + (6)(0) + (7)(1) + (8)(1)}{2 + 3 + 7 + 7 + 8 + 3 + 0 + 1 + 1}$$

$$\bar{x} = \frac{\sum 0 + 3 + 14 + 21 + 32 + 15 + 0 + 7 + 8}{32}$$

$$\bar{x} = \frac{100}{32}$$

$$\bar{x} = 3.125$$

5. The sum of the data values is 108.

6. There are 12 data values.

7. The mean of the data values is 9.

7. The mean of the data values is:

8. The mean of the data is:

$$\text{mean}(L_1, L_2) = 11.0625$$

9. The mean of the data is:

$$\text{mean}(L_1, L_2) = 10.8$$

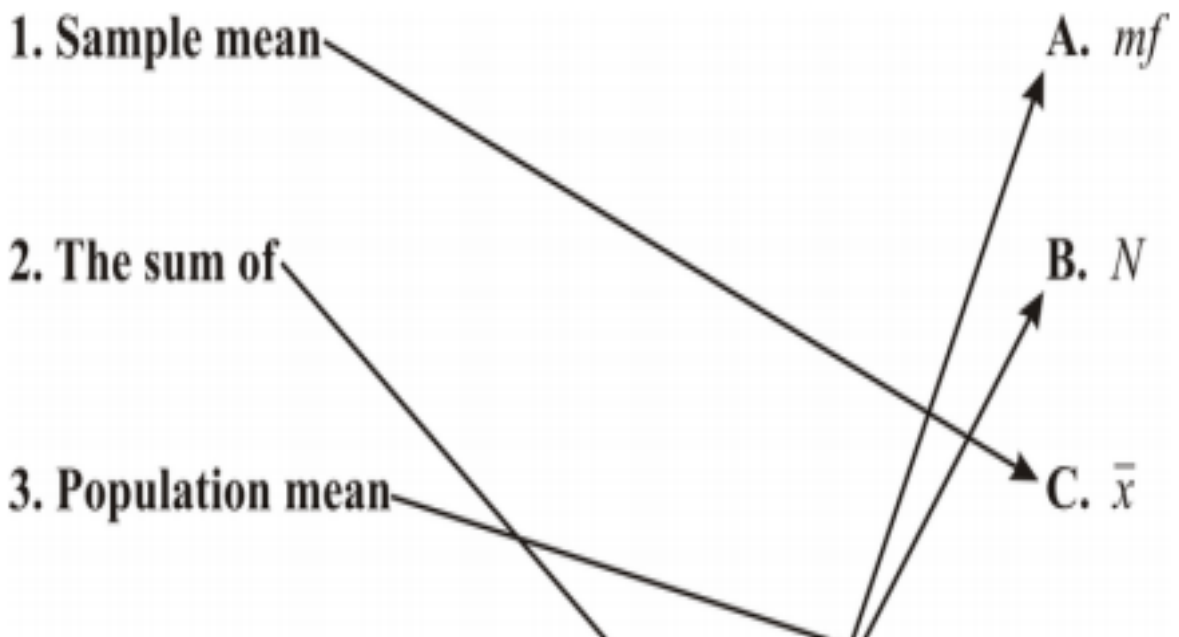
10. The mean of the data is:

$$\text{mean}(L_1, L_2) = 15.6$$

5.3 Grouped Data to Find the Mean

Answers

1.



4. Number of data for a sample

5. Product of the midpoint and the frequency

6. Number of data for a population

D. μ

E. n

F. Σ

The table is created by completing problems 2 – 4

TABLE 5.3:

Weight (pounds)	Number of Babies f	Midpoint of Class m	Product mf
[3 – 5)	8	4	32
[5 – 7)	25	6	150
[7 – 9)	45	8	360
[9 – 11)	18	10	180
[11 – 13)	4	12	48

2. The summation of the values of for each class can be calculated as follows:
 $32 + 150 + 360 + 180 + 48 = 770$

3. The value of N is 100.

4. The mean weight for a baby can be calculated as follows:

$$\mu = \frac{\Sigma mf}{N} \qquad \mu = \frac{770}{100}$$
$$\mu = \frac{32 + 150 + 360 + 180 + 48}{100} \qquad \mu = 7.7 \text{ pounds}$$

The table is created by completing problems 5 – 7

TABLE 5.4:

Age (years)	Number of Teachers f	Midpoint of Class m	Product mf
[25 – 35)	7	30	210
[35 – 45)	8	40	320
[45 – 55)	16	50	800
[55 – 65)	10	60	600
[65 – 75)	9	70	630

5. The summation of the values of for each class can be calculated as follows:
 $210 + 320 + 800 + 600 + 630 = 2,560$

6. The value of n is 50.

7. The mean age for a teacher can be calculated as follows:

$$\bar{x} = \frac{\sum mf}{n} \qquad \bar{x} = \frac{2,560}{50}$$

$$\bar{x} = \frac{210 + 320 + 800 + 600 + 630}{50} \qquad \bar{x} = 51.2 \text{ years}$$

The table is created by completing problems 8 – 10

TABLE 5.5:

Mileage	Number of Cars f	Midpoint of Class m	Product mf
[0 – 40,000)	3	20,000	60,000
[40,000 – 80,000)	6	60,000	360,000
[80,000 – 120,000)	10	100,000	1,000,000
[120,000 – 160,000)	4	140,000	560,000
[160,000 – 200,000)	2	180,000	360,000

8. The summation of the values of for each class can be calculated as follows:
 $60,000 + 360,000 + 1,000,000 + 560,000 + 360,000 = 2,340,000$

9. The value of N is 25.

10. The mean number of miles on a car can be calculated as follows:

$$\mu = \frac{\sum mf}{N} \qquad \mu = \frac{2,340,000}{25}$$

$$\mu = \frac{60,000 + 360,000 + 1,000,000 + 560,000 + 360,000}{25} \qquad \mu = 93,600 \text{ miles}$$

5.4 Median

Answers

- B An outlier is a value that is very small or very large compared to the majority of values in a data set.
- B 10, 25, 38, 39, 39, 42, 71, 76 The median is the number in the position: . The number below the 4.5 position is 39, and the number above the 4.5 position is 39. The median is .
- D There are 23 seats, which is an odd number. The median is the number in the position: . The median seat is seat number 12.
- C 55, 58, 62, 63, 68, 70, 71, 79, 81, 82 The median is the number in the position: . The number below the 5.5 position is 68, and the number above the 5.5 position is 70. The median is .

5. A 32, 34, 36, 38 The median is the number in the position: . The number below the 2.5 position is 34, and the number above the 2.5 position is 36. The median is .
6. B The median is the number of bars sold by the student in the position: . The number below the 15.5 position is 21, and the number above the 15.5 position is 21. The median is .

7. The medians can be calculated as follows:

a.

\$24,500	\$14,280
\$26,450	\$16,725
\$22,660	\$22,660
\$25,200	\$24,500
\$16,725	\$25,200
\$27,600	\$26,450
\$14,280	\$27,600
\$28,500	\$28,500
\$29,700	\$29,700
\$32,450	\$32,450

The median is the number in the position: . The number below the 5.5 position is \$25,200, and the number above the 5.5 position is \$26,450. The median retail price for the cars is .

b.

\$18,750	\$13,000
\$21,300	\$14,225
\$19,900	\$18,750
\$22,100	\$19,900
\$14,225	\$21,300
\$22,150	\$22,100
\$13,000	\$22,150
\$25,370	\$25,370
\$27,350	\$27,350
\$28,775	\$28,775

The median is the number in the position: . The number below the 5.5 position is \$21,300, and the number above the 5.5 position is \$22,100. The median median dealer's cost for the cars is .

8. The median number of power outages can be calculated as follows:

4	5	3	4	2	1	0	3	2	7	2	3
0	1	2	2	2	3	3	3	4	4	5	7

The median is the number in the position: . The number below the 6.5 position is 3, and the number above the 6.5 position is 3. The median number of power outages is .

9. The median number of safety devices aboard the boats can be calculated as follows:

7 14 10 5 11 2 8 6 9 7 13 4 12 8 3
 2 3 4 5 6 7 7 8 8 9 10 11 12 13 14

The median is the number in the position: . The number in the 8th position is 8. The median number of safety devices aboard the boats is 8.

10. The median wage for the teacher's assistant can be calculated as follows:

\$700 \$550 \$760 \$670 \$500 \$925 \$600
 \$480 \$390 \$800 \$850 \$365 \$525
 \$365 \$390 \$480 \$500 \$525 \$550 \$600 \$670 \$700 \$760
 \$800 \$850 \$925

The median is the number in the position: . The number in the 7th position is \$600. The median wage for the teacher's assistant is \$600.

5.5 Median of Large Sets of Data

Answers

1. To find the answer, enter the frequency table into L1 and L2 and use median command on the MATH menu. The median age of the hockey players is 13.

```
Stat Enter
L1 | L2 | L3 | 1
---|---|---|
10 |    |    |
10 |    |    |
10 |    |    |
10 |    |    |
10 |    |    |
10 |    |    |
11 |    |    |
-----|
L1(n)=10
```

```
stat CALC Enter (L1
1-Var Stats
x̄=12.7
Σx=635
Σx²=8195
Sx=1.63195138
σx=1.615549442
↓n=50
```

The median age of the hockey players is 13.

```
1-Var Stats
↑Sx=1.63195138
σx=1.615549442
n=50
minX=10
Q1=11
↓Med=13
```

2. To find the answer, enter the individual data values into L1 and use 1-Var Stats. The median score for the 14 rolls of the die is 3.

```
1-Var Stats
↑Sx=1.511857892
σx=1.456862718
n=14
minX=1
Q1=2
↓Med=3
```

3. To find the answer, enter the frequency table into L1 and L2 and use median command on the MATH menu. The median score for the players is 5.

```
median(L1,L2)
```

5

4. To find the answer, enter the frequency table into L1 and L2 and use median command on the MATH menu. The median score for Monday's quiz is 3.

```
median(L1,L2)
3
```

5. To find the answer, enter the frequency table into L1 and L2 and use median command on the MATH menu. The median number of coins in a student's pocket is 4.

```
median(L1,L2)
4
```

6. To find the answer, enter the individual data values into L1 and use 1-Var Stats. The median time of the participants in the race is 4.8 minutes.

```
1-Var Stats
↑Sx=1.055576821
σx=1.010637862
n=12
minX=3.1
Q1=4.05
↓Med=4.8
```

7. Answer:

```
median(L1,L2)
25
```

8. Answer:

```
median(L1,L2)
6
```

9. Answer:

9. Answer.

10. Answer

```
median(L1,L2)
56
```

5.6 Mode

Answers

1. C
2. D
3. B
4. A
5. B
6. The modes are as follows:
 - a. 6
 - b. 16
7. There are two modes for the scores on the English quizzes. The modes are 6 and 7.
8. The mode of the amounts of time spent studying for the math test is 10 - 20 minutes.
9. The number of questions attempted most by the students was 42.
10. The mode of the numbers that were rolled is 3.
11. The mode of the numbers of games that students attended is 8.
12. The smallest possible value for m is 9.
13. The data set has two modes: 3 and 5. Each value appears 3 times. The distribution can be described as bimodal.
14. Answers to this question will vary. Some acceptable responses would be:
 - A business could use the mode to determine the most popular selling item.
 - A sports team could use the mode to determine which player is most consistent.
 - A teacher could use the mode to determine the length of a test by the number of questions completed by the students on previous tests.
 - A business could use the mode to determine the most popular sizes when ordering new stock.
15. The mode of the temperatures for the month of June is 74°F.

