

# Describing Data: Center, Spread, and Shape

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Score: \_\_\_\_\_ / 24

## Q Quick Review

When you collect data, you can describe it in three ways. The **center** is a typical value — the **mean** (average) or the **median** (middle value). The **spread** tells how far the data stretches — the **range** is the largest value minus the smallest. The **shape** describes the overall pattern: data can be **symmetric** (balanced around the center), **skewed** (a tail stretching one way), or have a **cluster** or a **gap**. Together, center, spread, and shape give a clear picture of the data.

◊ **Example:** For the data 5, 7, 7, 8, 9, 12, find the range and describe the center.

⇒ Start with the spread. The largest value is 12 and the smallest is 5, so the range is  $12 - 5 = 7$ . Now the center: add all six values,  $5 + 7 + 7 + 8 + 9 + 12 = 48$ , and divide by 6 to get a mean of 8. The median is the average of the two middle values, 7 and 8, which is 7.5. So a typical value is about 8, and the data spreads across a range of 7.

**Answer:** range = 7, mean = 8

## PRACTICE

Describe the center or spread of each data set as asked.

- |                               |       |                                  |       |
|-------------------------------|-------|----------------------------------|-------|
| 1. Range of 3, 5, 8, 10       | _____ | 11. Median of 1, 3, 5, 7, 9      | _____ |
| 2. Range of 12, 4, 9, 20, 7   | _____ | 12. Median of 10, 14, 11, 17     | _____ |
| 3. Range of 15, 15, 15, 15    | _____ | 13. Range of 100, 50, 75, 90, 60 | _____ |
| 4. Range of 6, 1, 9, 4, 11, 2 | _____ | 14. Mean of 7, 7, 7, 7           | _____ |
| 5. Range of 40, 25, 60, 35    | _____ | 15. Median of 8, 2, 6, 4, 10, 12 | _____ |
| 6. Mean of 4, 6, 8, 10        | _____ | 16. Range of 18, 9, 9, 18        | _____ |
| 7. Mean of 2, 5, 8            | _____ | 17. Mean of 12, 18, 24           | _____ |
| 8. Mean of 10, 20, 30, 40, 50 | _____ | 18. Median of 5, 5, 8, 10, 12    | _____ |
| 9. Median of 3, 7, 9          | _____ | 19. Range of 7, 7, 7, 7, 7       | _____ |
| 10. Median of 2, 4, 6, 8      | _____ | 20. Mean of 6, 6, 12, 12         | _____ |

## ◆ Word Problems

21. The daily high temperatures for a week were 68, 70, 72, 71, 69, 73, 67 degrees. Find the range and the mean. \_\_\_\_\_
22. A class measured the lengths of 5 leaves in centimeters: 8, 8, 9, 12, 13. Is the data clustered low, clustered high, or spread evenly? Find the range too. \_\_\_\_\_
23. Eight friends counted the apps on their phones: 10, 12, 12, 13, 14, 15, 15, 49. Which value looks unusual, and what is the range? \_\_\_\_\_
24. A baker recorded muffins sold each day: 20, 22, 21, 23, 22, 20, 24. Find the mean and describe whether the data is fairly steady or very spread out. \_\_\_\_\_



## Answer Keys

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|---|--|
| <p>1. <input type="text" value="7"/></p> <p>2. <input type="text" value="16"/></p> <p>3. <input type="text" value="0"/></p> <p>4. <input type="text" value="10"/></p> <p>5. <input type="text" value="35"/></p> <p>6. <input type="text" value="7"/></p> <p>7. <input type="text" value="5"/></p> <p>8. <input type="text" value="30"/></p> <p>9. <input type="text" value="7"/></p> <p>10. <input type="text" value="5"/></p> <p>11. <input type="text" value="5"/></p> <p>12. <input type="text" value="25/2"/></p> | <p>13. <input type="text" value="50"/></p> <p>14. <input type="text" value="7"/></p> <p>15. <input type="text" value="7"/></p> <p>16. <input type="text" value="9"/></p> <p>17. <input type="text" value="18"/></p> <p>18. <input type="text" value="8"/></p> <p>19. <input type="text" value="0"/></p> <p>20. <input type="text" value="9"/></p> <p>21. <input type="text" value="range = 6, mean = 70"/></p> <p>22. <input type="text" value="clustered low; range = 5"/></p> <p>23. <input type="text" value="49 is unusual; range = 39"/></p> <p>24. <input type="text" value="mean = 21 6/7; fairly steady"/></p> |
|---|--|

### Step-by-Step Explanations

- |  |   |
|--|---|
| <p>1. Range is largest minus smallest: <math>10 - 3 = 7</math>.</p> <p>2. The largest value is 20 and the smallest is 4, so <math>20 - 4 = 16</math>.</p> <p>3. All values are the same, so the range is <math>15 - 15 = 0</math>.</p> <p>4. The biggest is 11 and the smallest is 1: <math>11 - 1 = 10</math>.</p> <p>5. Subtract the smallest from the largest: <math>60 - 25 = 35</math>.</p> <p>6. Add to get 28, then divide by 4: <math>28 \div 4 = 7</math>.</p> <p>7. The sum is 15, and <math>15 \div 3 = 5</math>.</p> <p>8. The total is 150, and <math>150 \div 5 = 30</math>.</p> <p>9. With three values in order, the middle one is 7.</p> <p>10. With four values, average the two middle ones: <math>(4 + 6) \div 2 = 5</math>.</p> <p>11. In order, the middle of five values is 5.</p> <p>12. Order them: 10, 11, 14, 17. The middle two are 11 and 14, so the median is 12.5.</p> <p>13. Largest minus smallest: <math>100 - 50 = 50</math>.</p> | <p>14. The sum is 28, and <math>28 \div 4 = 7</math> — equal values keep the same mean.</p> <p>15. Order them: 2, 4, 6, 8, 10, 12. Average the middle two, 6 and 8, to get 7.</p> <p>16. The largest is 18 and the smallest is 9: <math>18 - 9 = 9</math>.</p> <p>17. Add to get 54, then <math>54 \div 3 = 18</math>.</p> <p>18. In order, the middle value of five numbers is 8.</p> <p>19. Every value is 7, so the range is 0 — no spread at all.</p> <p>20. The sum is 36, and <math>36 \div 4 = 9</math>.</p> <p>21. The highest is 73 and the lowest is 67, so the range is <math>73 - 67 = 6</math>. The seven values add to 490, and <math>490 \div 7 = 70</math> degrees.</p> <p>22. Three of the five leaves are 8 or 9 cm, so the data clusters at the low end with two larger values. The range is <math>13 - 8 = 5</math> cm.</p> <p>23. Seven values sit between 10 and 15, but 49 is far above the rest — it is an outlier. The range is <math>49 - 10 = 39</math>, stretched wide by that one value.</p> <p>24. The seven values add to 152, so the mean is <math>152 \div 7 \approx 21.7</math>. Since every day is between 20 and 24, the range is only 4 — the sales are fairly steady.</p> |
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