

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.

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|-------------------------------|-------|----------------------------------|-------|
| 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

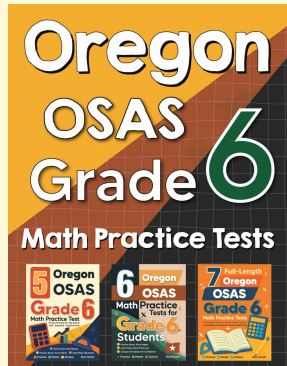
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|---------------------------------------|---|
| 1. <input type="text" value="7"/> | 13. <input type="text" value="50"/> |
| 2. <input type="text" value="16"/> | 14. <input type="text" value="7"/> |
| 3. <input type="text" value="0"/> | 15. <input type="text"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

Step-by-Step Explanations

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| <p>1. Range is largest minus smallest: $10 - 3 = 7$.</p> <p>2. The largest value is 20 and the smallest is 4, so $20 - 4 = 16$.</p> <p>3. All values are the same, so the range is $15 - 15 = 0$.</p> <p>4. The biggest is 11 and the smallest is 1: $11 - 1 = 10$.</p> <p>5. Subtract the smallest from the largest: $60 - 25 = 35$.</p> <p>6. Add to get 28, then divide by 4: $28 \div 4 = 7$.</p> <p>7. The sum is 15, and $15 \div 3 = 5$.</p> <p>8. The total is 150, and $150 \div 5 = 30$.</p> <p>9. With three values in order, the middle one is 7.</p> <p>10. With four values, average the two middle ones: $(4 + 6) \div 2 = 5$.</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: $100 - 50 = 50$.</p> | <p>14. The sum is 28, and $28 \div 4 = 7$ — 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: $18 - 9 = 9$.</p> <p>17. Add to get 54, then $54 \div 3 = 18$.</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 $36 \div 4 = 9$.</p> <p>21. The highest is 73 and the lowest is 67, so the range is $73 - 67 = 6$. The seven values add to 490, and $490 \div 7 = 70$ 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 $13 - 8 = 5$ 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 $49 - 10 = 39$, stretched wide by that one value.</p> <p>24. The seven values add to 152, so the mean is $152 \div 7 \approx 21.7$. Since every day is between 20 and 24, the range is only 4 — the sales are fairly steady.</p> |
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