

# Distance on the Coordinate Plane

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

## Q Quick Review

When two points share the **same  $x$ -coordinate**, they lie on a *vertical* line, and the distance between them is the difference of their  $y$ -coordinates. When two points share the **same  $y$ -coordinate**, they lie on a *horizontal* line, and the distance is the difference of their  $x$ -coordinates. To find that difference, subtract and take the **absolute value** so the distance is positive. A shortcut: if the signs differ, *add* the absolute values; if the signs match, *subtract* them.

◇ **Example:** Find the distance between  $(3, 2)$  and  $(3, -5)$ .

⇒ Notice both points have the same  $x$ -coordinate, 3, so they sit on the same vertical line. That means the distance is just how far apart their  $y$ -coordinates are. The  $y$ -values are 2 and  $-5$ . Subtract and take the absolute value:  $|2 - (-5)| = |2 + 5| = |7| = 7$ . Since one point is above the  $x$ -axis and one is below, it also makes sense to add the distances  $2 + 5 = 7$ . The distance is 7 units.

**Answer:** 7

## PRACTICE

Find the distance between each pair of points.

- |                              |       |                               |       |
|------------------------------|-------|-------------------------------|-------|
| 1. $(2, 1)$ and $(2, 6)$     | _____ | 11. $(0, 6)$ and $(0, -2)$    | _____ |
| 2. $(4, 3)$ and $(4, 9)$     | _____ | 12. $(-7, 4)$ and $(2, 4)$    | _____ |
| 3. $(1, 5)$ and $(8, 5)$     | _____ | 13. $(-6, 2)$ and $(-6, 9)$   | _____ |
| 4. $(2, 7)$ and $(10, 7)$    | _____ | 14. $(-1, -8)$ and $(-1, -2)$ | _____ |
| 5. $(3, -2)$ and $(3, 4)$    | _____ | 15. $(-9, -3)$ and $(-2, -3)$ | _____ |
| 6. $(5, -1)$ and $(5, 3)$    | _____ | 16. $(4, -5)$ and $(4, -12)$  | _____ |
| 7. $(-4, 1)$ and $(6, 1)$    | _____ | 17. $(8, 0)$ and $(8, -10)$   | _____ |
| 8. $(-3, 5)$ and $(2, 5)$    | _____ | 18. $(-5, 7)$ and $(-5, -7)$  | _____ |
| 9. $(-2, -3)$ and $(-2, 4)$  | _____ | 19. $(-11, 6)$ and $(4, 6)$   | _____ |
| 10. $(5, -1)$ and $(-3, -1)$ | _____ | 20. $(6, -9)$ and $(6, 9)$    | _____ |

## ◆ Word Problems

21. On a map grid, a school is at  $(2, 3)$  and a park is at  $(2, 11)$ , in blocks. How many blocks apart are they? \_\_\_\_\_
22. Two bus stops are at  $(-4, 5)$  and  $(7, 5)$  on a city grid. How far apart are they? \_\_\_\_\_
23. A rectangle has corners at  $(-3, 2)$ ,  $(5, 2)$ ,  $(5, -4)$ , and  $(-3, -4)$ . What is its perimeter? \_\_\_\_\_
24. A boat starts at  $(0, -6)$  and sails to  $(0, 9)$  on a coordinate map. How far did it travel? \_\_\_\_\_



## Answer Keys

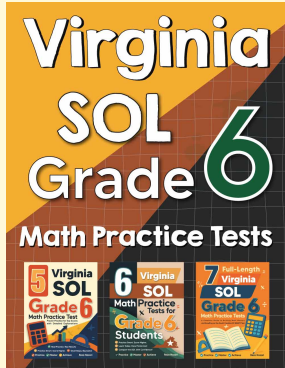
- |                                    |   |
|------------------------------------|---|
| 1. <input type="text" value="5"/>  | 13. <input type="text" value="7"/>        |
| 2. <input type="text" value="6"/>  | 14. <input type="text" value="6"/>        |
| 3. <input type="text" value="7"/>  | 15. <input type="text" value="7"/>        |
| 4. <input type="text" value="8"/>  | 16. <input type="text" value="7"/>        |
| 5. <input type="text" value="6"/>  | 17. <input type="text" value="10"/>       |
| 6. <input type="text" value="4"/>  | 18. <input type="text" value="14"/>       |
| 7. <input type="text" value="10"/> | 19. <input type="text" value="15"/>       |
| 8. <input type="text" value="5"/>  | 20. <input type="text" value="18"/>       |
| 9. <input type="text" value="7"/>  | 21. <input type="text" value="8 blocks"/> |
| 10. <input type="text" value="8"/> | 22. <input type="text" value="11 units"/> |
| 11. <input type="text" value="8"/> | 23. <input type="text" value="28 units"/> |
| 12. <input type="text" value="9"/> | 24. <input type="text" value="15 units"/> |

### Step-by-Step Explanations

- |  |   |
|--|---|
| <p>1. Same <math>x</math>, so subtract the <math>y</math>-values: <math> 6 - 1  = 5</math>.</p> <p>2. Same <math>x</math>, so <math> 9 - 3  = 6</math>.</p> <p>3. Same <math>y</math>, so subtract the <math>x</math>-values: <math> 8 - 1  = 7</math>.</p> <p>4. Same <math>y</math>, so <math> 10 - 2  = 8</math>.</p> <p>5. Same <math>x</math>; the signs differ, so add: <math>2 + 4 = 6</math>.</p> <p>6. Same <math>x</math>; signs differ, so add: <math>1 + 3 = 4</math>.</p> <p>7. Same <math>y</math>; signs differ, so add: <math>4 + 6 = 10</math>.</p> <p>8. Same <math>y</math>; signs differ, so add: <math>3 + 2 = 5</math>.</p> <p>9. Same <math>x</math>; signs differ, so add: <math>3 + 4 = 7</math>.</p> <p>10. Same <math>y</math>; signs differ, so add: <math>5 + 3 = 8</math>.</p> <p>11. Same <math>x</math>; signs differ, so add: <math>6 + 2 = 8</math>.</p> <p>12. Same <math>y</math>; signs differ, so add: <math>7 + 2 = 9</math>.</p> <p>13. Same <math>x</math>, both <math>y</math>-values positive, so <math> 9 - 2  = 7</math>.</p> | <p>14. Same <math>x</math>, both <math>y</math>-values negative, so <math> -8 - (-2)  = 6</math>.</p> <p>15. Same <math>y</math>, both <math>x</math>-values negative, so <math> -9 - (-2)  = 7</math>.</p> <p>16. Same <math>x</math>, both <math>y</math>-values negative, so <math> -5 - (-12)  = 7</math>.</p> <p>17. Same <math>x</math>, so <math> 0 - (-10)  = 10</math>.</p> <p>18. Same <math>x</math>; signs differ, so add: <math>7 + 7 = 14</math>.</p> <p>19. Same <math>y</math>; signs differ, so add: <math>11 + 4 = 15</math>.</p> <p>20. Same <math>x</math>; signs differ, so add: <math>9 + 9 = 18</math>.</p> <p>21. Same <math>x</math>-coordinate, so subtract the <math>y</math>-values: <math> 11 - 3  = 8</math> blocks.</p> <p>22. Same <math>y</math>-coordinate; the <math>x</math>-values have different signs, so add: <math>4 + 7 = 11</math> units.</p> <p>23. The width is <math> 5 - (-3)  = 8</math> and the height is <math> 2 - (-4)  = 6</math>. Perimeter = <math>2(8 + 6) = 28</math> units.</p> <p>24. Same <math>x</math>-coordinate; the <math>y</math>-values have different signs, so add: <math>6 + 9 = 15</math> units.</p> |
|--|---|



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