

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

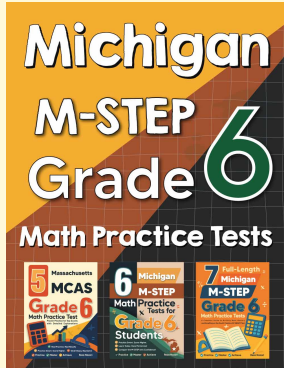
- | | |
|------------------------------------|---|
| 1. <input type="text" value="5"/> | 13. <input type="text" value="7"/> |
| 2. <input type="text" value="6"/> | 14. <input type="text" value="6"/> |
| 3. <input type="text" value="7"/> | 15. <input type="text" value="7"/> |
| 4. <input type="text" value="8"/>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