Distance on the Coordinate Plane

Name: _____	Date: _____	Score: _____ / 24

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 $(2, 6)$ _____
2. $(4, 3)$ and $(4, 9)$ _____
3. $(1, 5)$ and $(8, 5)$ _____
4. $(2, 7)$ and $(10, 7)$ _____
5. $(3, -2)$ and $(3, 4)$ _____
6. $(5, -1)$ and $(5, 3)$ _____
7. $(-4, 1)$ and $(6, 1)$ _____
8. $(-3, 5)$ and $(2, 5)$ _____
9. $(-2, -3)$ and $(-2, 4)$ _____
10. $(5, -1)$ and $(-3, -1)$ _____
11. $(0, 6)$ and $(0, -2)$ _____
12. $(-7, 4)$ and $(2, 4)$ _____
13. $(-6, 2)$ and $(-6, 9)$ _____
14. $(-1, -8)$ and $(-1, -2)$ _____
15. $(-9, -3)$ and $(-2, -3)$ _____
16. $(4, -5)$ and $(4, -12)$ _____
17. $(8, 0)$ and $(8, -10)$ _____
18. $(-5, 7)$ and $(-5, -7)$ _____
19. $(-11, 6)$ and $(4, 6)$ _____
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. $\boxed{5}$
2. $\boxed{6}$
3. $\boxed{7}$
4. $\boxed{8}$
5. $\boxed{6}$
6. $\boxed{4}$
7. $\boxed{10}$
8. $\boxed{5}$
9. $\boxed{7}$
10. $\boxed{8}$
11. $\boxed{8}$
12. $\boxed{9}$
13. $\boxed{7}$
14. $\boxed{6}$
15. $\boxed{7}$
16. $\boxed{7}$
17. $\boxed{10}$
18. $\boxed{14}$
19. $\boxed{15}$
20. $\boxed{18}$
21. $\boxed{8 \text{ blocks}}$
22. $\boxed{11 \text{ units}}$
23. $\boxed{28 \text{ units}}$
24. $\boxed{15 \text{ units}}$

Step-by-Step Explanations

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

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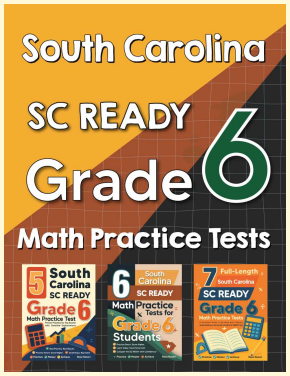

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