Distance on the Coordinate Plane

Horizontal and vertical coordinate distance: Mistakes and missing information

Name _____ **Date** _____ **Score** _____ / 6

QUICK REVIEW

For points on one horizontal or vertical line, subtract the coordinates that change and take the absolute value. The distance is a nonnegative count of grid steps. This works whether the coordinates are on the same side of 0 or on opposite sides.

Worked example

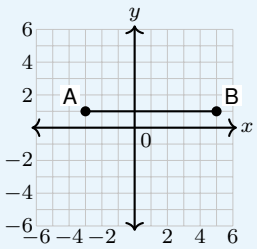
Plot A$(-3, 1)$ and B$(5, 1)$, then find AB.

1. Place both points along the line $y = 1$, at $x = -3$ and $x = 5$.

2. Change in x is $5 - (-3) = 8$; distance $= |8| = 8$ units.

3. Reversing the subtraction gives $|-3 - (5)| = 8$ too.

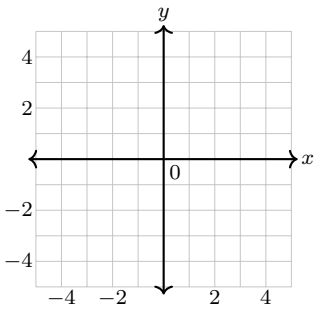
Answer: 8 units.



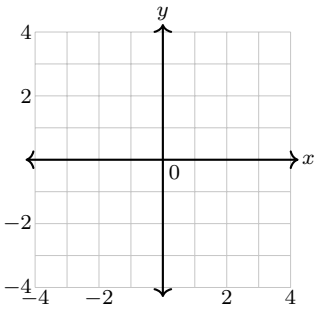
Practice Problems

Show your thinking.

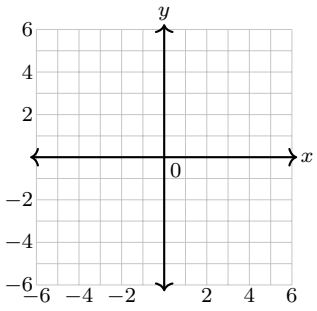
1. A student says the distance from $(-2, 3)$ to $(4, 3)$ is 2. Plot and correct it.



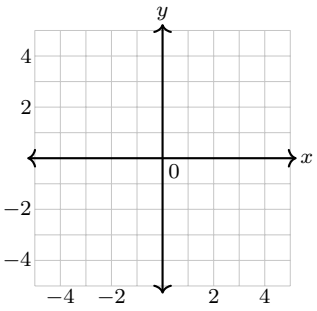
2. A point above $(1, -3)$ on the same vertical line is 5 units away. Plot both points and check the distance.



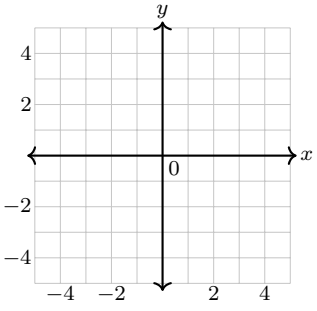
3. A student reports distance -3 between $(-5, -1), (-2, -1)$. Plot and repair the sign.



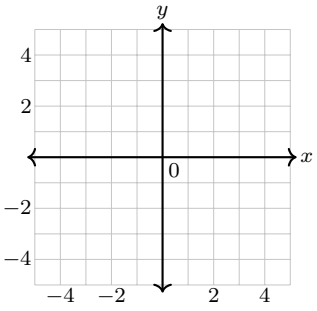
4. An endpoint is 7 units right of $(-4, 0)$. Recover and plot the endpoint; verify distance.



5. A student adds $-4 + 1 = -3$ for the distance between $(2, -4), (2, 1)$. Plot and repair it.



6. Plot $(-1, 2), (4, 2)$ and show why reversing subtraction cannot change the distance.



Answer Key

1. 6 units.
2. Endpoint $(1, 2)$; distance 5 units.
3. 3 units.
4. Endpoint $(3, 0)$; distance 7 units.
5. 5 units.
6. 5 units.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Place both points along the line $y = 3$, at $x = -2$ and $x = 4$.
2. Change in x is $4 - (-2) = 6$; distance $= |6| = 6$ units.
3. Reversing the subtraction gives $| - 2 - (4)| = 6$ too.

Problem 2

1. The shared vertical line keeps $x = 1$. Move 5 units up from $y = -3$: $y = -3 + 5 = 2$.
2. The endpoint is $(1, 2)$; check $|2 - (-3)| = 5$ units.

Problem 3

1. Place both points along the line $y = -1$, at $x = -5$ and $x = -2$.
2. Change in x is $-2 - (-5) = 3$; distance $= |3| = 3$ units.
3. Reversing the subtraction gives $| - 5 - (-2)| = 3$ too.

Problem 4

1. A horizontal move keeps $y = 0$. Add 7 to the horizontal coordinate: $x = -4 + 7 = 3$.
2. The endpoint is $(3, 0)$; check $|3 - (-4)| = 7$ units.

Problem 5

1. Place both points along the line $x = 2$, at $y = -4$ and $y = 1$.
2. Change in y is $1 - (-4) = 5$; distance $= |5| = 5$ units.
3. Reversing the subtraction gives $| - 4 - (1)| = 5$ too.

Problem 6

1. Place both points along the line $y = 2$, at $x = -1$ and $x = 4$.
2. Change in x is $4 - (-1) = 5$; distance $= |5| = 5$ units.
3. Reversing the subtraction gives $| - 1 - (4)| = 5$ too.

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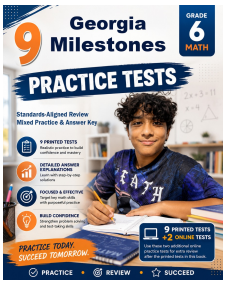

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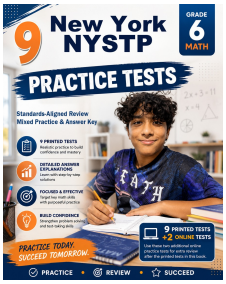

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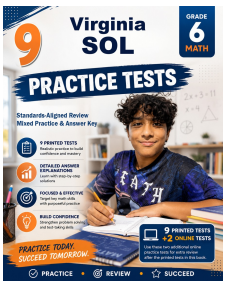

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