Distance on the Coordinate Plane

Horizontal and vertical coordinate distance: Models and calculations

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

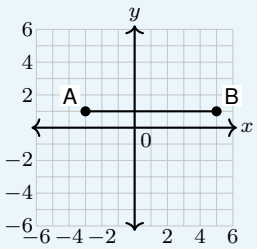
Plot A$(-3, 1)$ and B$(5, 1)$, then find AB.

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.

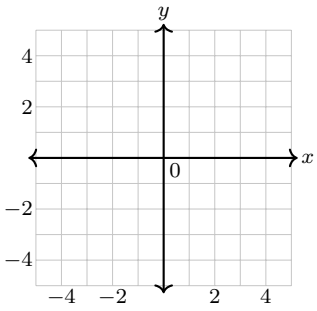
Answer: 8 units.



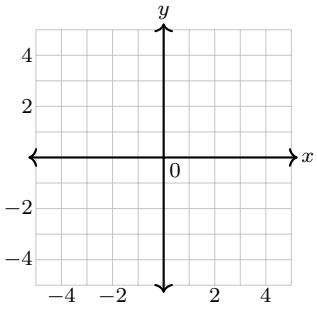
Practice Problems

Show your thinking.

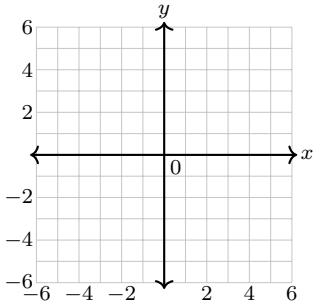
1. Plot $(-4, 1), (2, 1)$ and find their distance.



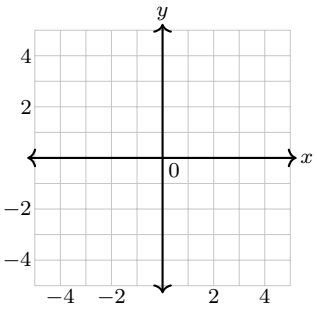
2. Plot $(3, -2), (3, 4)$ and find vertical distance.



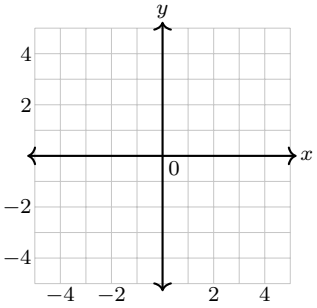
3. Plot $(-5, -3)$ and $(-1, -3)$. Find their distance. Does the segment cross $x = 0$?



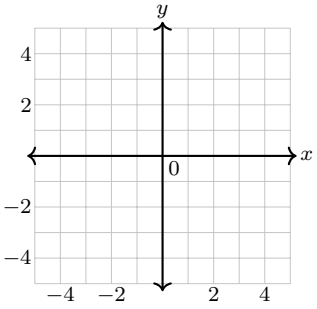
4. Plot $(0, -4), (0, 3)$ and measure the coordinate distance.



5. Two stops are $(-2, 2)$ and $(4, 2)$. Plot and find their separation in grid units.



6. Plot $(-3, -4), (-3, -1)$ and find distance.



Answer Key

1. 6 units.
2. 6 units.
3. 4 units. It does not cross $x = 0$.
4. 7 units.
5. 6 units.
6. 3 units.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

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

Problem 2

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

Problem 3

1. Place both points along the line $y = -3$, at $x = -5$ and $x = -1$.
2. Change in x is $-1 - (-5) = 4$; distance $= |4| = 4$ units.
3. Reversing the subtraction gives $|-5 - (-1)| = 4$ too.
4. Both $x = -5$ and $x = -1$ are negative, so the segment stays to the left of $x = 0$. The absolute difference still works.

Problem 4

1. Place both points along the line $x = 0$, at $y = -4$ and $y = 3$.
2. Change in y is $3 - (-4) = 7$; distance $= |7| = 7$ units.
3. Reversing the subtraction gives $|-4 - (3)| = 7$ too.

Problem 5

1. Place both points along the line $y = 2$, 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 6

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

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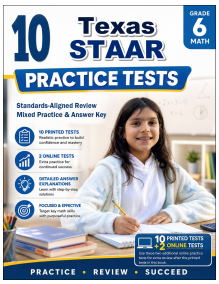

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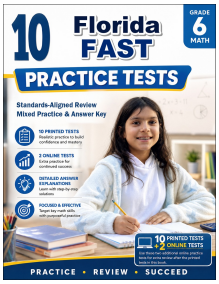

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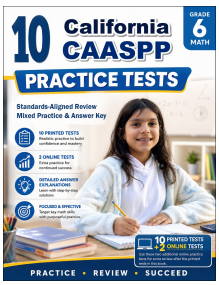

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