

Grade 6 · The Coordinate Plane · Worksheet

Answer Key

Common Core 6.NS.C.6b, 6.NS.C.6c, 6.NS.C.8, 6.G.A.3 · mathovore.fr

This answer key gives complete worked solutions for all 20 problems on the coordinate plane worksheet. Each solution shows the signs of the coordinates or the absolute values that were added, so students can check every step of their work.

Grade 6 Common Core: 6.NS.C.6b · 6.NS.C.6c · 6.NS.C.8 · 6.G.A.3

Problem 1: Name the quadrant

Check the signs of x and y .

a) Quadrant I b) Quadrant II c) Quadrant III d) Quadrant IV e) On the y-axis (no quadrant), because $x = 0$.

Problem 2: On Which Axis

- a. The x-coordinate is 0, so the point is on the **y-axis**.
- b. The y-coordinate is 0, so the point is on the **x-axis**.
- c. Neither coordinate is 0, so the point is on **neither axis** (it is in Quadrant I).
- d. The x-coordinate is 0, so the point is on the **y-axis**.
- e. The y-coordinate is 0, so the point is on the **x-axis**.

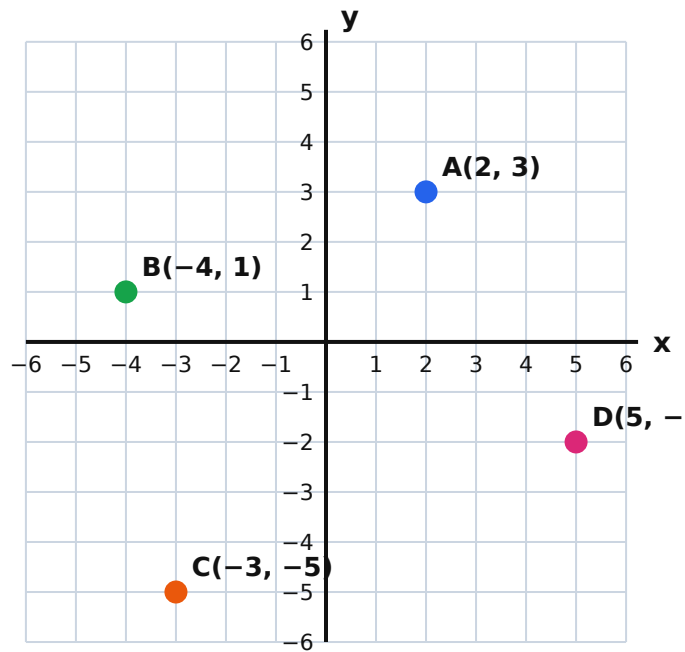
Problem 3: Signs of Coordinates

- a. Left of the y-axis and above the x-axis: **Quadrant II**.
- b. Right of the y-axis and below the x-axis: **Quadrant IV**.
- c. Left and below: **Quadrant III**.
- d. Both -8 and -9 are negative, so the point is in **Quadrant III**.

Problem 4: Plot the points

For each point, move along the x-axis first, then up or down. A : 2 right, 3 up (Quadrant I). B : 4 left, 1 up (II). C : 3 left, 5 down (III). D : 5 right, 2 down (IV).

The four points are plotted as shown.



The four plotted points.

Problem 5: Read ordered pairs

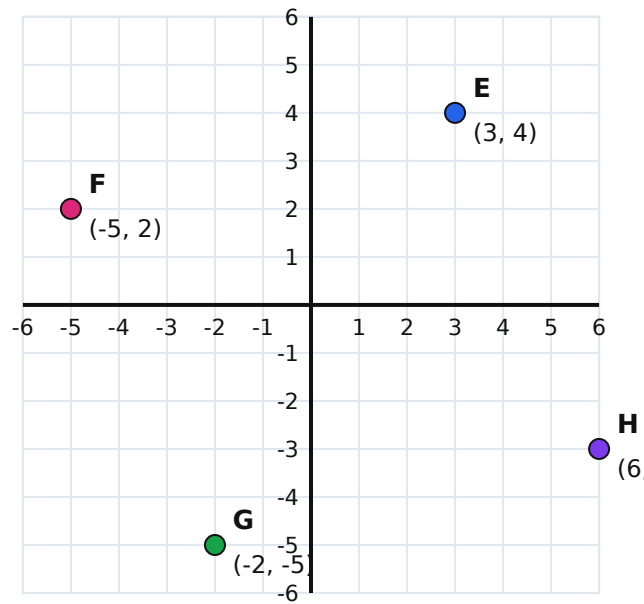
Read the x-coordinate along the x-axis first, then the y-coordinate.

$P(-3, 2)$ $Q(4, 3)$ $R(-2, -4)$ $S(5, -1)$

Problem 6: Reading Four Points

Start at the origin, move left or right for the x-coordinate, then up or down for the y-coordinate.

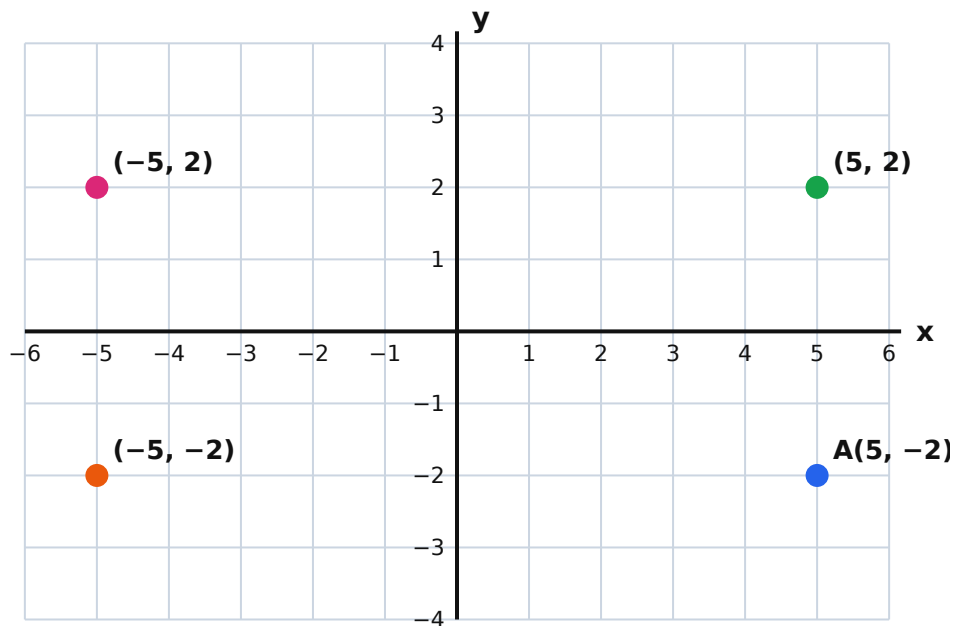
- E : 3 right, 4 up: $(3, 4)$, Quadrant I
- F : 5 left, 2 up: $(-5, 2)$, Quadrant II
- G : 2 left, 5 down: $(-2, -5)$, Quadrant III
- H : 6 right, 3 down: $(6, -3)$, Quadrant IV



The four ordered pairs.

Problem 7: Reflect a point

- a) Across the x-axis, change the sign of y : $(5, 2)$.
 - b) Across the y-axis, change the sign of x : $(-5, -2)$.
 - c) First $(5, 2)$, then across the y-axis: $(-5, 2)$.
- a) $(5, 2)$ b) $(-5, -2)$ c) $(-5, 2)$**



Problem 8: Reflect Three Points

Across the x-axis only the y-coordinate changes sign. Across the y-axis only the x-coordinate changes sign.

- a. x-axis: $(3,4)$. y-axis: $(-3,-4)$.
- b. x-axis: $(-5,-2)$. y-axis: $(5,2)$.
- c. x-axis: $(-1,6)$. y-axis: $(1,-6)$.

Problem 9: Points that mirror each other

The x-coordinates -6 and 6 are opposites, and the y-coordinates are both 4. So B is the reflection of A across the y-axis.

Distance: the points are on opposite sides of the y-axis, so $|-6|+|6|=6+6=12$.

Opposite x-coordinates, same y-coordinate; line of reflection is the y-axis; distance 12 units.

Problem 10: Which Axis Is the Mirror

- a. The x-coordinates match and the y-coordinates are opposites. The points reflect across the **x-axis**.
- b. The y-coordinates match and the x-coordinates are opposites. The points reflect across the **y-axis**.
- c. Both coordinates are opposites. The points reflect across **both axes** (first one axis, then the other).

Problem 11: Distance on a horizontal line

The y-coordinates are equal, so use the x-coordinates. They are on opposite sides of 0:
 $|-7|+|2|=7+2=9$.

9 units

Problem 12: Distance on a vertical line

- a) Same x-coordinate, so use y: -8 and -3 are on the same side of 0. $|-8|-|-3|=8-3=5$.
- b) 6 and -5 are on opposite sides of 0. $|6|+|-5|=6+5=11$.

a) 5 units b) 11 units

Problem 13: Distance with Absolute Value

When the points are on opposite sides of an axis, add the absolute values of the coordinates that differ.

- a. Same x-coordinate. $|4| + |-6| = 4 + 6 = \mathbf{10 \text{ units}}$
- b. Same y-coordinate. $|-8| + |5| = 8 + 5 = \mathbf{13 \text{ units}}$
- c. Same x-coordinate. $|-2.5| + |6| = 2.5 + 6 = \mathbf{8.5 \text{ units}}$

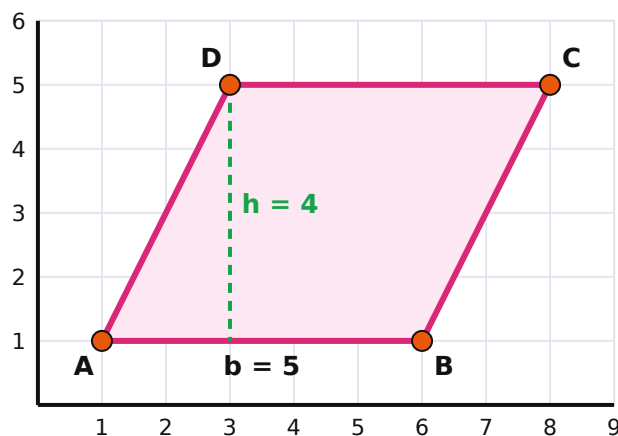
Problem 14: Parallelogram on the Plane

Base: A and B have the same y-coordinate, so $AB = |6 - 1| = 5$ units.

Height: the base is on $y = 1$ and the opposite side is on $y = 5$, so the height is $5 - 1 = 4$ units.

$$A = bh = 5 \times 4 = 20$$

The base is **5 units**, the height is **4 units**, and the area is **20 square units**.



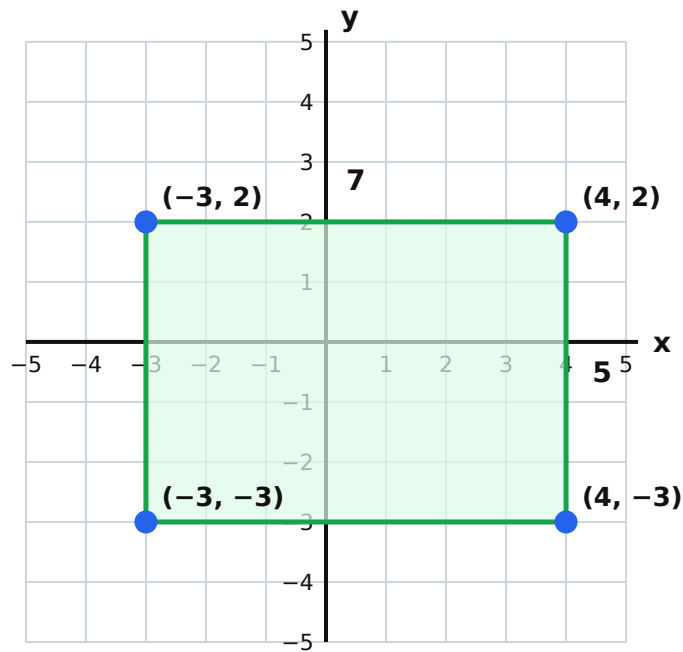
Base 5 and height 4.

Problem 15: Draw a rectangle

Top side: from $x = -3$ to $x = 4$, $|-3| + |4| = 7$. Right side: from $y = 2$ to $y = -3$, $|2| + |-3| = 5$. Opposite sides are equal, so the bottom is 7 and the left is 5.

$$\text{Perimeter: } 7 + 5 + 7 + 5 = 24.$$

Sides 7, 5, 7, 5 units; perimeter 24 units.



Rectangle: 7 units by 5 units.

Problem 16: Soccer Field Map

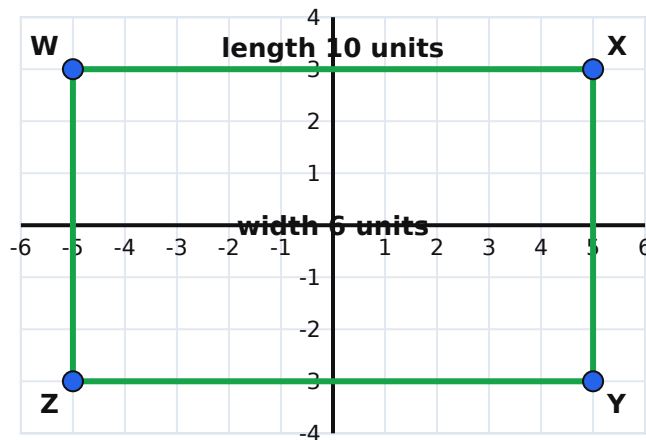
Length: $WX = |-5| + |5| = 10$ units, which is $10 \times 10 = 100$ yards.

Width: $XY = |3| + |-3| = 6$ units, which is $6 \times 10 = 60$ yards.

Perimeter: $2(100 + 60) = 2(160) = 320$ yards.

Area: $100 \times 60 = 6,000$ square yards.

The field is **100 yd by 60 yd**, with a perimeter of **320 yd** and an area of **6,000 square yards**.



Length 10 units, width 6 units.

Problem 17: Scavenger Hunt Route

- a. Store to flagpole: same x-coordinate, $|5 - (-4)| = 9$ blocks.
Flagpole to lake: same y-coordinate, $|6 - (-3)| = 9$ blocks.
Lake to dock: same x-coordinate, $|5 - (-1)| = 6$ blocks.
- b. $9 + 9 + 6 = \mathbf{24 \text{ blocks}}$
- c. $24 \div 3 = \mathbf{8 \text{ minutes}}$
- d. The dock $(6, -1)$ has a positive x-coordinate and a negative y-coordinate: **Quadrant IV**.

Problem 18: Walking route

Library to school: same x-coordinate -4 . $|5| + |-2| = 5 + 2 = 7$ blocks.

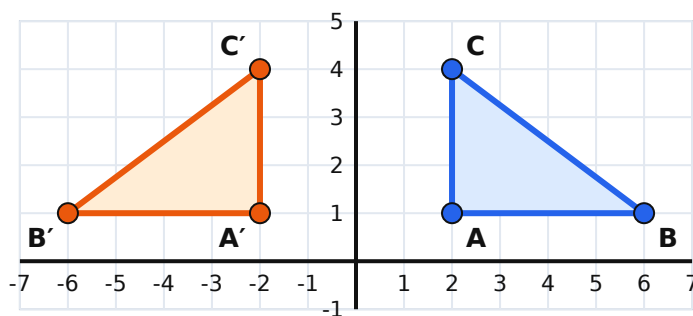
School to park: same y-coordinate -2 . $|-4| + |5| = 4 + 5 = 9$ blocks.

Total: $7 + 9 = 16$.

7 blocks, 9 blocks, 16 blocks in all.

Problem 19: Mirror-Image Flower Beds

- a. Reflecting across the y-axis changes the sign of each x-coordinate: $A'(-2, 1)$, $B'(-6, 1)$, $C'(-2, 4)$.
- b. $AA' = |2| + |-2| = \mathbf{4 \text{ yards}}$. $BB' = |6| + |-6| = \mathbf{12 \text{ yards}}$.
- c. One bed has base $AB = 4$ and height $AC = 4 - 1 = 3$. Area: $\frac{1}{2}(4)(3) = 6 \text{ yd}^2$. A reflection keeps the size, so both beds total $6 + 6 = 12 \text{ yd}^2$.



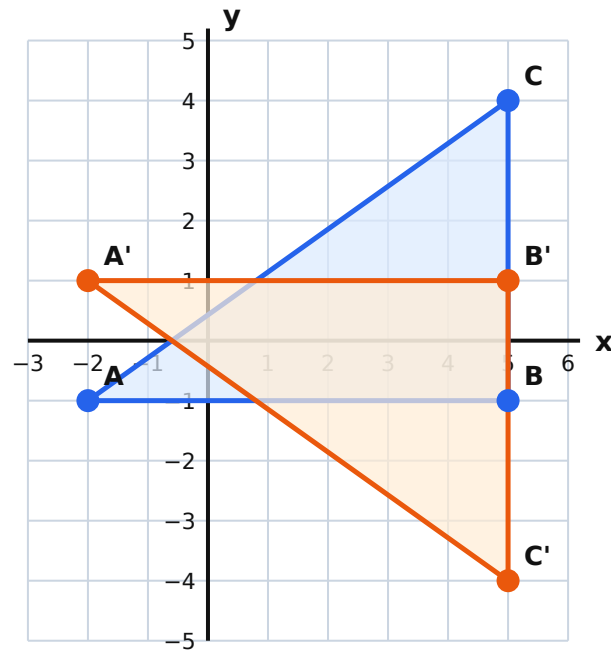
The two beds are mirror images.

Problem 20: Triangle and its reflection

- a) AB : same y, $|-2| + |5| = 7$. BC : same x, $|4| + |-1| = 5$.
- b) Change the sign of each y-coordinate: $A'(-2, 1)$, $B'(5, 1)$, $C'(5, -4)$.
- c) $A'B'$: $|-2| + |5| = 7$. $B'C'$: $|1| + |-4| = 5$. The lengths are the same as in part a, because a

reflection does not change distances.

a) 7 and 5 b) $A'(-2,1)$, $B'(5,1)$, $C'(5,-4)$ c) 7 and 5, equal to part a



Triangle ABC and its reflection.