

Treasure Island Coordinates

Mission: An old captain's map uses a four-quadrant grid. Sail to landmarks, find their coordinates, decode reflection clues, and dig for the treasure.

Big question: How do we locate points in all four quadrants and find distances between them?

★ Warm-up: Where am I?

Name the quadrant or axis.

$(3, -5)$ ✓ **IV.**

$(-2, -7)$ ✓ **III.**

Key vocabulary

Coordinate plane	A grid formed by an x-axis and a y-axis.
Ordered pair	(x, y) : x first, then y.
Quadrant	One of the four regions of the plane.
Reflection	A flip across an axis.

1 Box 1

Landmark log

Sail to each landmark and record it.

Landmark	x	y	Quadrant
Palm Grove 🌴	-5	3	II
Bat Cave 🦇	-6	-4	III
Old Dock ⚓	7	-2	IV

2 Box 2

Clue 1: reflection

In the simulator: Sail there and dig.

Why is the reflection at $(4, -6)$?

☐ Reflecting across the x-axis keeps x and changes the sign of y ☐ You swap x and y ☐ You change both signs

✓ **Reflecting across the x-axis keeps x and changes the sign of y**

3 Box 3

Distance

How far is it from Skull Rock $(4, 6)$ to the chest at $(4, -6)$?

Answer: _____ units ✓ **12**

4 Box 4

Clue 2

In the simulator: Sail there and dig.

How far is the second chest from Palm Grove?

Answer: _____ units ✓ **10**

5 Box 5

Legend: the final chest Legend only

Where is the final chest?

☐ (6, 4) ☐ (-6, 4) ☐ (6, -4) ☐ (4, 6)

✓ (6, 4)

6 Box 6

Captain's notes

Explain how you can tell which quadrant a point is in just from its signs.

Look for: Mentions positive; Mentions negative; Names quadrants



Exit ticket: answer the big question in your own words

How do we locate points in all four quadrants and find distances between them?

Look for: A point (x, y) tells how far left/right (x) and down/up (y) from the origin. Signs tell the quadrant: (+,+) I, (-,+) II, (-,-) III, (+,-) IV. Reflecting across the x-axis changes the sign of y; across the y-axis changes the sign of x. Points on the same horizontal line are $|x_1 - x_2|$ apart.



Completion codes

Students see a code like **ABC-I3** when they finish. The first part must match below. The letter is the level (E = Explorer, I = Investigator, L = Legend), and the number at the end is how many stars they earned.

Level	Code starts with
 Explorer	1DN-E
 Investigator	1SM-I
 Legend	1WS-L



Watch for these misconceptions

- "-8 is greater than -3 because $8 > 3$." On the number line, -8 is farther left.
- "Absolute value makes a number the opposite." It is distance, so $|5|$ is still 5.
- "(3, 2) and (2, 3) are the same point." Order matters: x first, then y.