Solving Problems on the Coordinate Plane

Solving Problems on the Coordinate Plane: Models and Computation

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QUICK REVIEW

For a horizontal leg, subtract the x-coordinates. For a vertical leg, subtract the y-coordinates. Add the lengths of all the legs, not just the last one. Use the map scale to convert grid units.

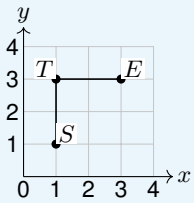
Worked example

A toy track goes from $(1, 1)$ up to $(1, 3)$, then right to $(3, 3)$. Each grid unit is 2 m. Find the track length.

1. Up: $3 - 1 = 2$ units. Right: $3 - 1 = 2$ units. The track is $2 + 2 = 4$ units.

2. At 2 m per unit, the length is $4 \times 2 = 8$ m.

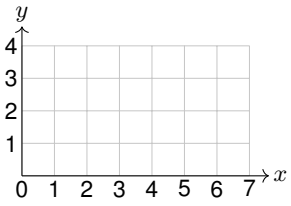
Answer: 8 m.



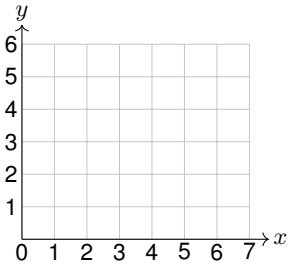
Practice Problems

Show your thinking.

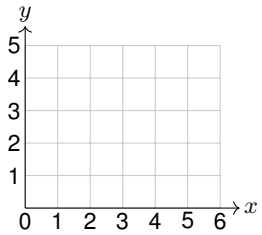
1. Plot home $H(1, 2)$ and park $P(6, 2)$. Each grid unit is one block. Find the direct street distance.



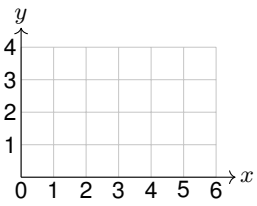
2. Plot $A(2, 1), B(2, 5), C(6, 5)$ and draw the street route A to B to C. Find its length in grid units.



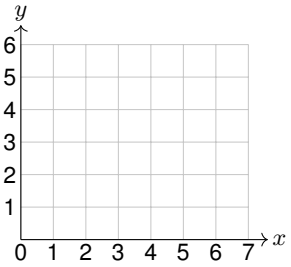
3. A walker goes from $(1, 1)$ right to $(5, 1)$, then up to $(5, 4)$. A child says the walk is 3 units long. Plot the route and correct the length.



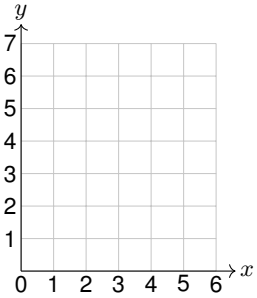
4. Plot the corners $(1, 1), (5, 1), (5, 3), (1, 3)$ and close the field boundary. Find the area in square grid units.



5. A robot starts at $(2, 3)$, moves 4 units right, then 2 units up. Find and plot the ending point.



6. A shop S is at $(2, 6)$. A delivery site D must be on the same street running east-west and 3 units east. Find D and plot both sites.



Answer Key

1. 5 blocks.
2. 8 grid units.
3. 7 units, not 3.
4. 8 square grid units.
5. Endpoint $(6, 5)$.
6. $D(5, 6)$.

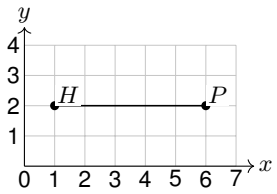
Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. The points share row $y = 2$, so the street runs horizontally.

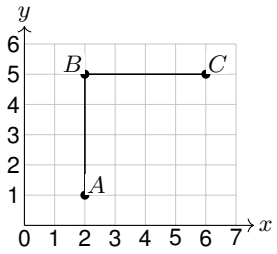
2. The street spans $6 - 1 = 5$ unit intervals, or 5 blocks.



Problem 2

1. AB stays in column 2 and goes up $5 - 1 = 4$ units.

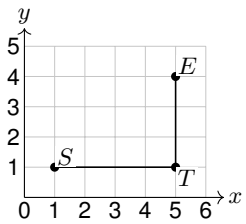
2. BC stays in row 5 and goes right $6 - 2 = 4$ units. Total: $4 + 4 = 8$ units.



Problem 3

1. The first leg stays at $y = 1$ and covers $5 - 1 = 4$ units.

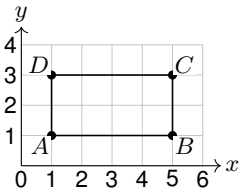
2. The final leg covers $4 - 1 = 3$ units. Add both legs: $4 + 3 = 7$ units.



Problem 4

1. The horizontal sides are $5 - 1 = 4$ units, and the vertical sides are $3 - 1 = 2$ units.

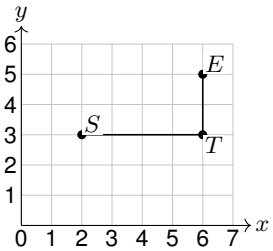
2. The field has 2 rows of 4 unit squares. Its area is $4 \times 2 = 8$ square units.



Problem 5

1. After moving right, the horizontal coordinate is $2 + 4 = 6$, so the turn is at $(6, 3)$.

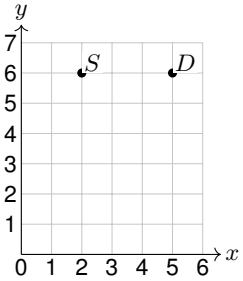
2. After moving up, the vertical coordinate is $3 + 2 = 5$. Mark the endpoint $(6, 5)$.



Problem 6

1. East is to the right, so the new first coordinate is $2 + 3 = 5$.

2. The same east-west street keeps $y = 6$. Plot $D(5, 6)$ on the row with S.



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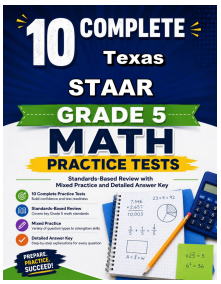

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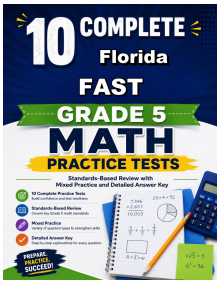

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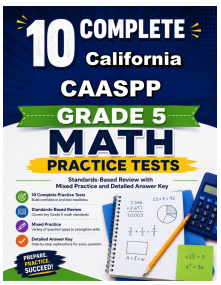

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