Finding Area on the Coordinate Plane

Area on the coordinate plane: Models and calculations

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QUICK REVIEW

Find lengths from coordinate differences, then use the matching area formula. A rectangle from $x = -2$ to 3 and $y = 1$ to 4 has width 5, height 3, area 15 square units. A right triangle with the same perpendicular base and height has half that area, 7.5. Count a gap across zero by adding distances.

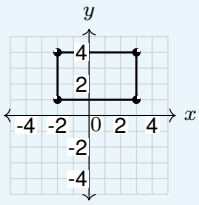
Worked example

Use coordinate differences. Plot and connect $(-2, 1)$, $(3, 1)$, $(3, 4)$, $(-2, 4)$ in order. Find the area.

1. Horizontal base $= 3 - (-2) = 5$ units; perpendicular height $= 4 - (1) = 3$ units.

2. Rectangle area $= 5 \times 3 = 15$ square units.

Answer: 15 square units.

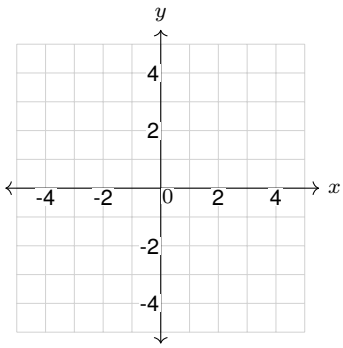


Practice Problems

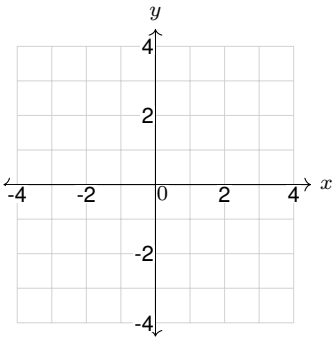
Show your thinking.

1. Find rectangle area. The vertices in order are $(-3, -1)$, $(2, -1)$, $(2, 3)$, $(-3, 3)$. Find the area using coordinate differences.

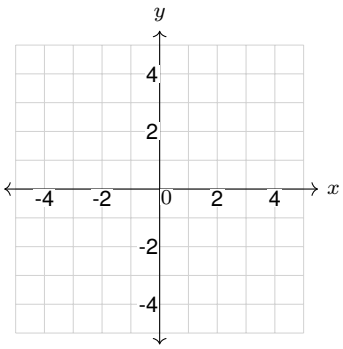
2. Find right-triangle area. Plot and connect $(-2, -2)$, $(4, -2)$, $(4, 1)$ in order. Find the area.



3. Use a side crossing zero. Plot and connect $(0, -3)$, $(3, -3)$, $(3, 2)$, $(0, 2)$ in order. Find the area.

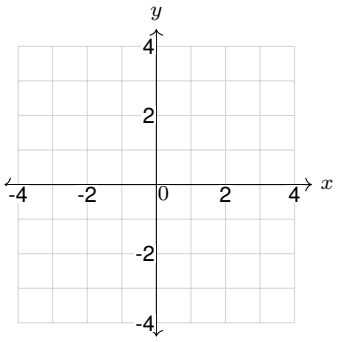


4. A triangular park is modeled. Plot and connect $(-4, 1)$, $(-1, 1)$, $(-1, 4)$ in order. Find the area.



5. Recover lengths from coordinates rather than estimating the sketch. The vertices in order are $(-1, -2)$, $(2, -2)$, $(2, 2)$, $(-1, 2)$. Find the area using coordinate differences.

6. Plot and connect $(-3, -2), (3, -2), (3, 0), (0, 0), (0, 3), (-3, 3)$. Split the L-shape into two rectangles and find its area.



Answer Key

1. 20 square units.
2. 9 square units.
3. 15 square units.
4. $\frac{9}{2}$ square units.
5. 12 square units.
6. 21 square units.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Horizontal base $= 2 - (-3) = 5$ units; perpendicular height $= 3 - (-1) = 4$ units.
2. Rectangle area $= 5 \times 4 = 20$ square units.

Problem 2

1. Horizontal base $= 4 - (-2) = 6$ units; perpendicular height $= 1 - (-2) = 3$ units.
2. Triangle area $= 6 \times 3/2 = 9$ square units.

Problem 3

1. Horizontal base $= 3 - (0) = 3$ units; perpendicular height $= 2 - (-3) = 5$ units.
2. Rectangle area $= 3 \times 5 = 15$ square units.

Problem 4

1. Horizontal base $= -1 - (-4) = 3$ units; perpendicular height $= 4 - (1) = 3$ units.
2. Triangle area $= 3 \times 3/2 = \frac{9}{2}$ square units.

Problem 5

1. Horizontal base $= 2 - (-1) = 3$ units; perpendicular height $= 2 - (-2) = 4$ units.
2. Rectangle area $= 3 \times 4 = 12$ square units.

Problem 6

1. Bottom rectangle: width $3 - (-3) = 6$, height $0 - (-2) = 2$, area $6 \times 2 = 12$.
2. Upper-left rectangle: width $0 - (-3) = 3$, height $3 - 0 = 3$, area $3 \times 3 = 9$.
3. Total $= 12 + 9 = 21$ square units.

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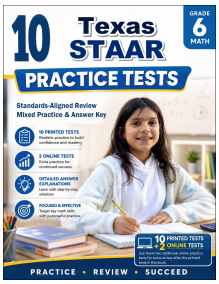

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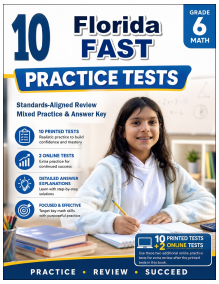

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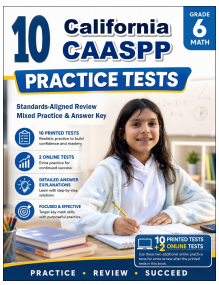

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