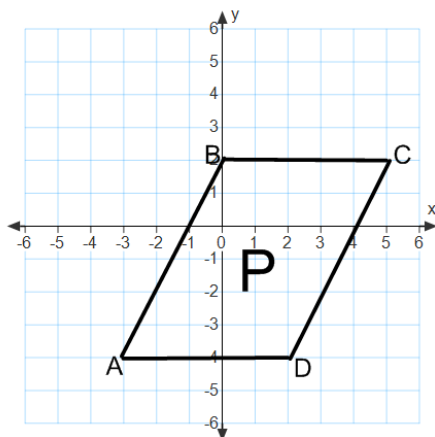# Lesson 19: Unknown Area Problems on the Coordinate Plane
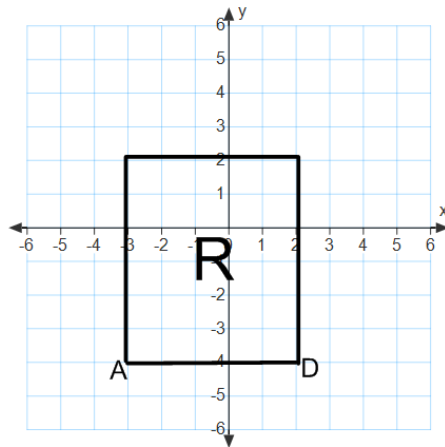
Classwork

Example: Area of a Parallelogram

The coordinate plane below contains figure P, parallelogram $ABCD$.

a.   Write the ordered pairs of each of the vertices next to the vertex points.

b.   Draw a rectangle surrounding figure P that has vertex points of A and C. Label the two triangles in the figure as S and T.

c.   Find the area of the rectangle.

d.   Find the area of each triangle.

e.   Use these areas to find the area of parallelogram $ABCD$.

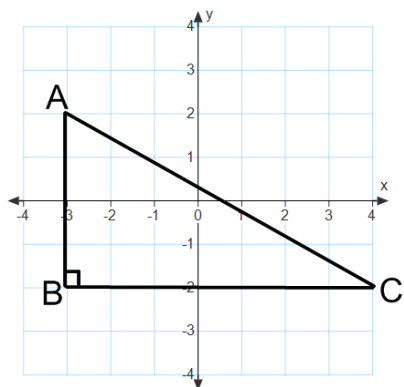|		
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The coordinate plane below contains figure R, a rectangle with the same base as the parallelogram above.
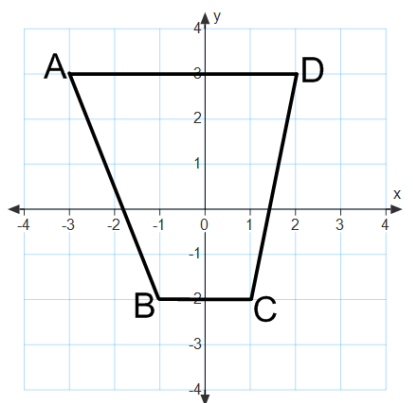

f. Draw triangles S and T and connect to figure R so that you create a rectangle that is the same size as the rectangle you created on the first coordinate plane.

g. Find the area of rectangle R.

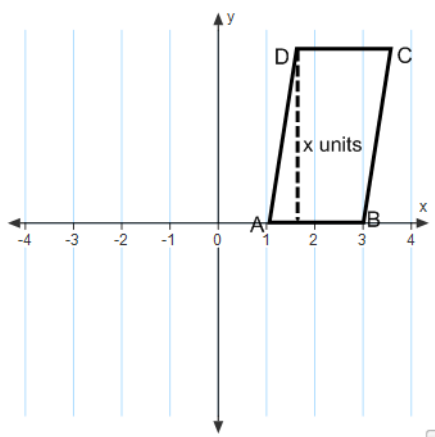h. What do figures R and P have in common?

Exercises

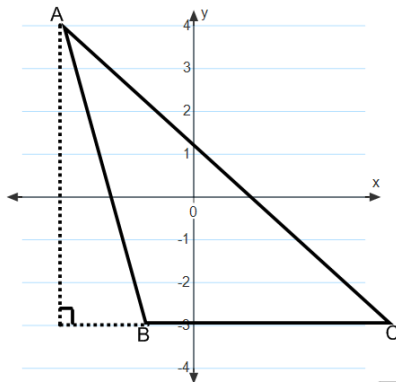1. Find the area of triangle ABC.

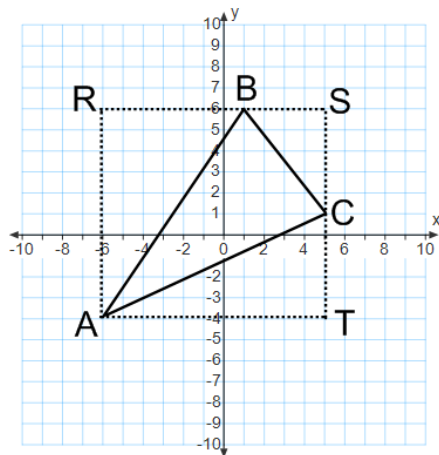2. Find the area of quadrilateral $ABCD$ two different ways.

3. The area of quadrilateral $ABCD = 12$ sq. units. Find x.

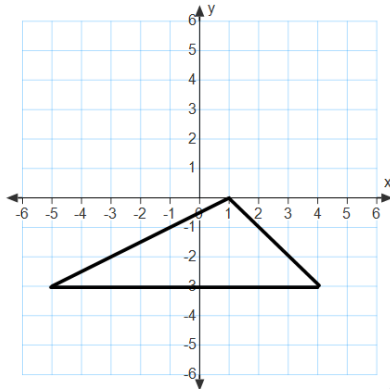4. The area of triangle $ABC = 14$ sq. units. Find the length of side BC.
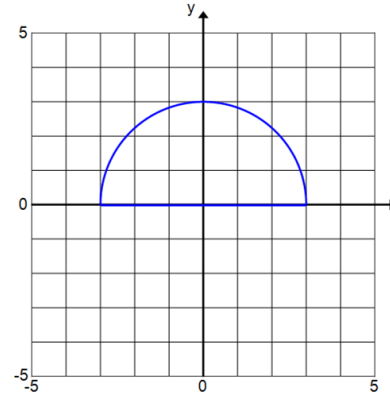

5. Find the area of triangle ABC.
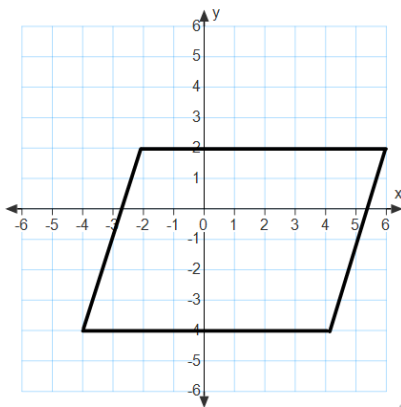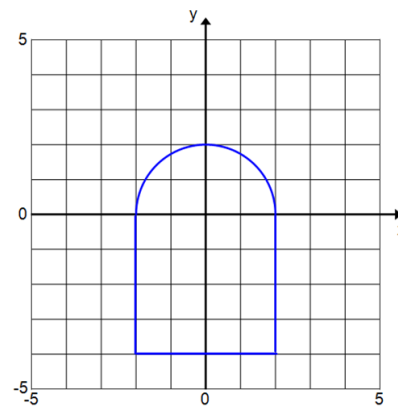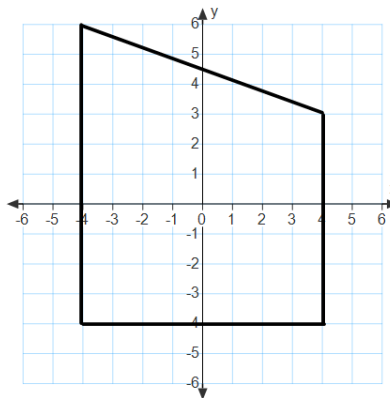
Problem Set

Find the area of each figure.
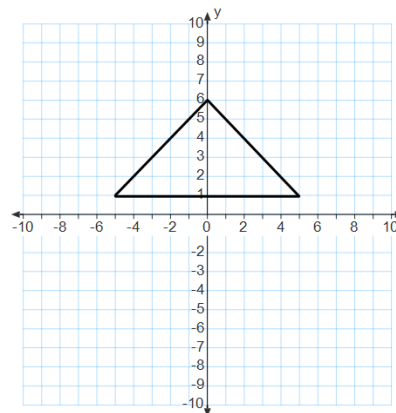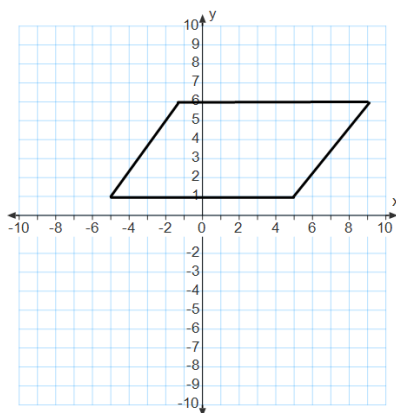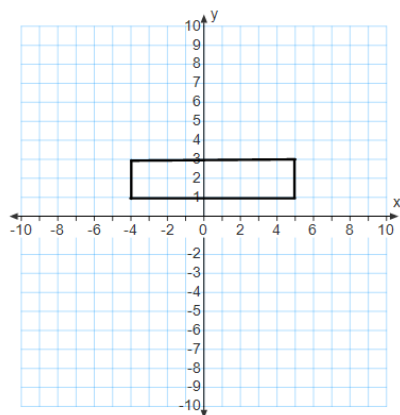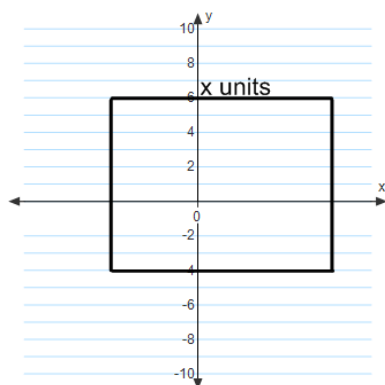
1.

2.

3.

4.

5.

6.

For Problems 7–9, draw a figure in the coordinate plane that matches each description.

7. A rectangle with area $= 18$ sq. units

8. A parallelogram with area $= 50$ sq. units
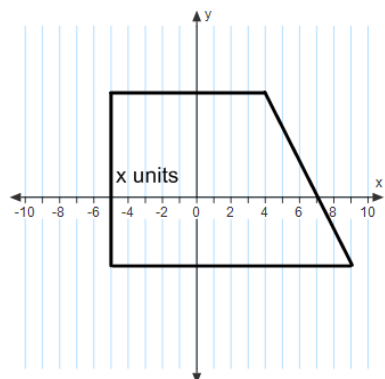
9. A triangle with area $= 25$ sq. units

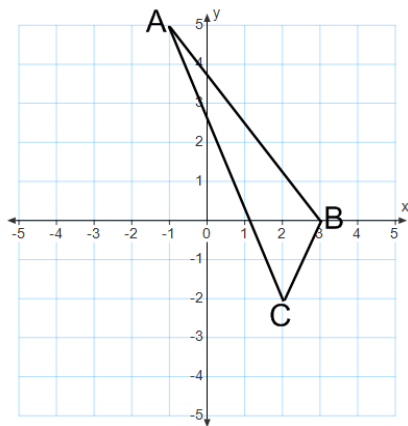Find the unknown value labelled as x on each figure.
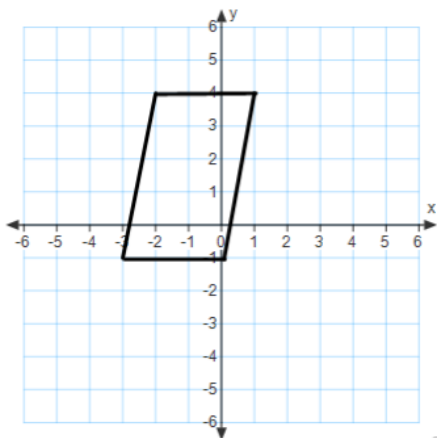
10. The rectangle has an area of 80 sq. units.

11. The trapezoid has an area of 115 sq. units.

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12. Find the area of triangle ABC.

13. Find the area of the quadrilateral using two different methods. Describe the methods used and explain why they result in the same area.

14. Find the area of the quadrilateral using two different methods. What are the advantages or disadvantages of each method?