

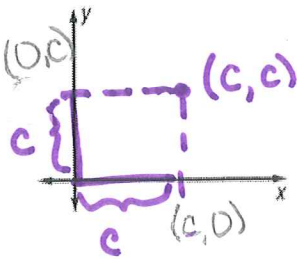
Name: \_\_\_\_\_

*Key*

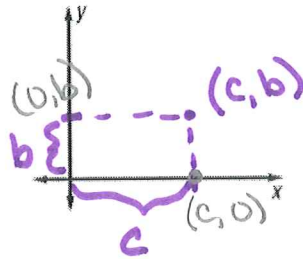
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# Coordinates of Quadrilaterals

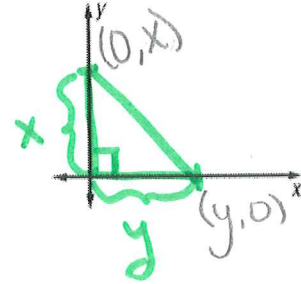
Ex 1.) Using the axis below, sketch square WXYZ with side lengths of length c.



Ex 2.) Using the axis below, sketch Rectangle WXYZ that has the length c and the width of b.

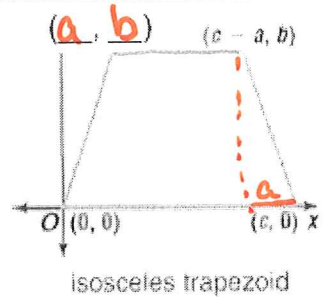
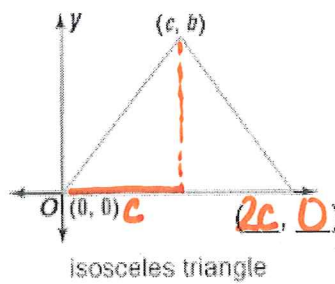
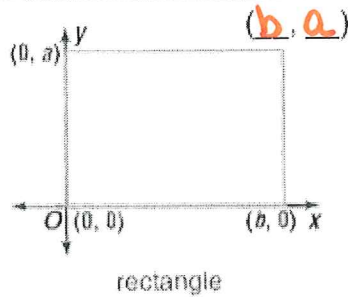
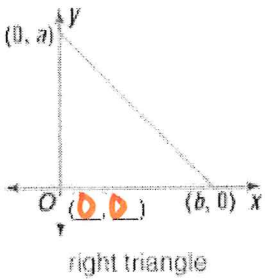


Ex 3.) Using the axis below, sketch right triangle ABC with legs of length x and y.



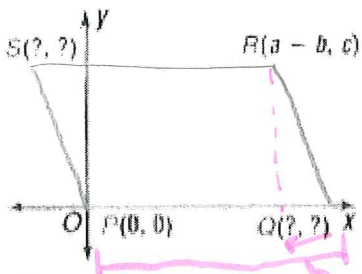
### Guidelines for Placing Figures on a Coordinate Plane

1. Use the origin as a vertex or center.
2. Place at least one side of a polygon on an axis.
3. Keep the figure within the first quadrant if possible.
4. Use coordinates that make computations as simple as possible.



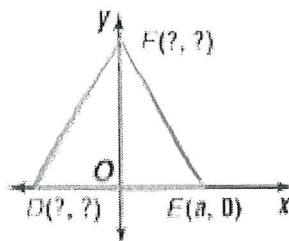
Now you practice:

PQRS is a parallelogram.



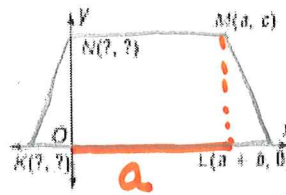
$S(-b, c)$   
 $Q(a+b, 0)$

$\triangle DEF$  is isosceles.

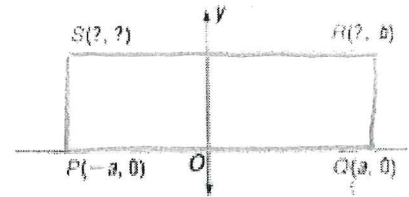


$D(-a, 0)$   
 $F(0, b)$

KLMN is an isosceles trapezoid. PQRS is a rectangle.



$K(-b, 0)$   
 $N(0, c)$



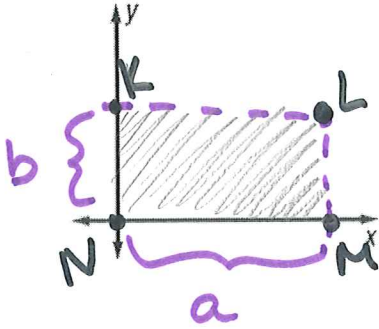
$S(-a, b)$   
 $R(a, b)$

Name: \_\_\_\_\_

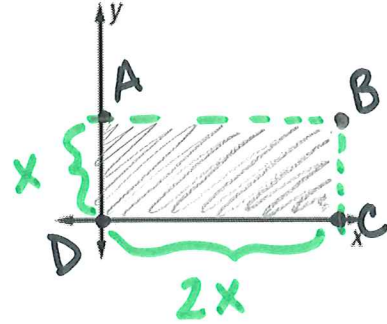
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Position and label each figure on the coordinate plane.

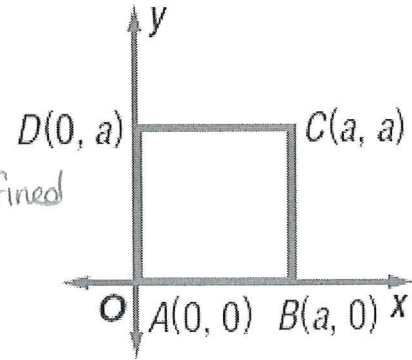
Ex 4. Parallelogram KLMN with length a and height b.



Ex 5. Rectangle ABCD with the length twice the width.



PROOF: Prove the following figure is a square.



a) Prove that the opposite sides are parallel.

$$AB = \frac{0-0}{a-0} = \frac{0}{a} = 0 \quad DA = \frac{a-0}{0-0} = \frac{a}{0} = \text{undefined}$$

$$BC = \frac{0-a}{a-a} = \frac{-a}{0} = \text{undefined} \quad \therefore \text{opp. sides are } \parallel$$

$$CD = \frac{a-a}{0-a} = \frac{0}{-a} = 0$$

b) Prove that consecutive sides form right angles (are perpendicular).

From the slopes above, we can see these are  $\perp$  because 0 and undefined are opposite reciprocals.

c) Prove that opposite sides are congruent.

Count the sides

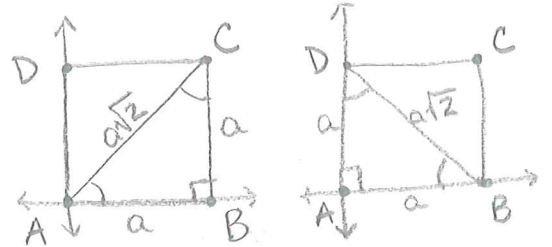
$$AB = a \text{ units} \quad AD = a \text{ units} \\ DC = a \text{ units} \quad CB = a \text{ units}$$

$\therefore$  opp. sides are  $\cong$

\* diagonals bisect each other will be shown thru same midpoint

d) Prove that the diagonals of a square are congruent.

We have 45-45-90 triangles from diagonals  $\therefore$  the diagonals are  $a\sqrt{2}$



e) Prove that the diagonals of a square are perpendicular.

$$DB = \frac{a-0}{0-a} = \frac{a}{-a} = -1 \quad AC = \frac{a-0}{a-0} = \frac{a}{a} = 1 \quad \therefore \text{diagonals are } \perp$$