

## 1. Warm Up - White Board Work and Scribbler

Do pages 348 # 3 to 7 ALL- white boards

#8a and 8c, 9a, 9c

Check your work and ask for clarification on any errors before moving to 2.

## 2. A) What is a trapezoid? (Use glossary).

A trapezoid is a four sided shape with exactly 1

b) Plot the points P (-2, 5) Q (-4, 3), R (4, -5), S (5, -2). Connect to make a quadrilateral. *pair of parallel sides*

c) Is this figure a trapezoid? JUSTIFY your answer.

$$m_{PQ} = \frac{2}{2} = 1$$

$$m_{RS} = \frac{3}{1} = 3$$

$$m_{PQ} \neq m_{RS}$$

~~PQ~~ ~~RS~~

$$Q(-4, 3)$$

$$R(4, -5)$$

$$m_{QR} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m_{QR} = \frac{-5 - 3}{4 - -4}$$

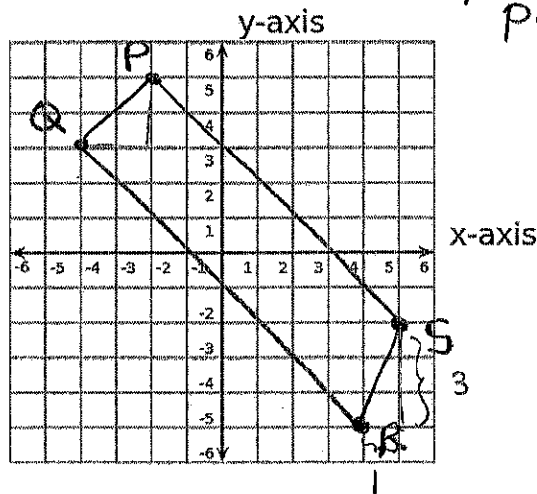
$$m_{QR} = \frac{-8}{8} = -1$$

$$m_{PS} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m_{PS} = \frac{-2 - 5}{5 - -2}$$

$$m_{PS} = \frac{-7}{7} = -1$$

3a) What is a parallelogram?



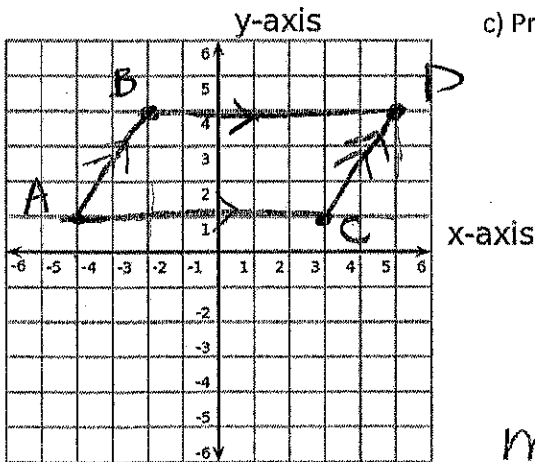
$$m_{PS} = m_{QR} \therefore PS \parallel QR$$

This is a trapezoid because it is a quadrilateral with exactly 1 pair of  $\parallel$  sides.

A quadrilateral with opposite sides that are parallel.

3.b) Plot the points A(-4, 1), B(-2, 5), C(3, 1) and D(5, 5). Connect to make a quadrilateral.

c) Prove or justify that ABCD is a parallelogram.



$$m_{AB} = \frac{2}{3} \quad m_{CD} = \frac{2}{3} \text{ (rise over run)}$$

$$m_{AB} = m_{CD}$$

$$\therefore AB \parallel CD$$

$$m_{AC} = m_{BD} = 0 \text{ (horizontal lines)}$$

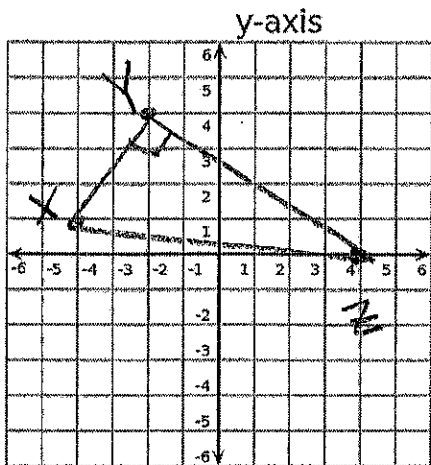
$$\therefore AC \parallel BD$$

Since  $AB \parallel CD$  and  $AC \parallel BD$ , ABCD is a parallelogram.

4.a) Plot the points X(-4,1), Y(-2,4), and Z(4,-0). Connect to make a triangle.

b) What is a right triangle?

A three sided shape with one angle = 90°.



c) Prove or justify that XYZ is a right triangle.

$$m_{xy} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m_{xy} = \frac{4 - 1}{-2 - (-4)} = \frac{3}{2}$$

$$m_{yz} = \frac{0 - 4}{4 - (-2)} = \frac{-4}{6} = -\frac{2}{3}$$

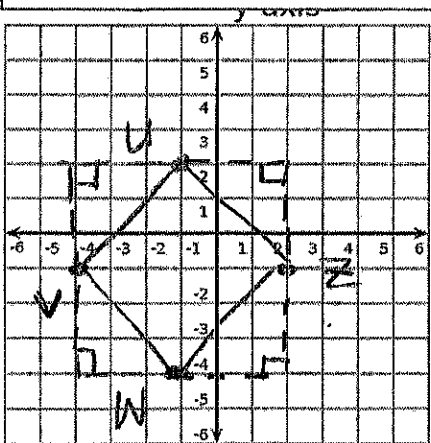
$$m_{yz} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{0 - 4}{4 - (-2)} = -\frac{2}{3}$$

Since  $m_{xy} = -\frac{1}{m_{yz}}$ , XY  $\perp$  YZ are  $\Delta XYZ$  is a right triangle.

5.a) Plot the points U(-1,2), V(-4,-1), W(-1,-4) and Z(2,-1). Connect to make a quadrilateral.

UVWZ is a parallelogram. What does this mean?

2 opposite sides are parallel.



b) Prove or justify that UVWZ is a rectangle.

Need to show we have  $\perp$  line segments.

$$m_{uv} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-1 - 2}{-4 - (-1)} = \frac{-3}{-3} = 1$$

$$m_{vw} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-4 - (-1)}{-1 - (-4)} = \frac{-3}{3} = -1$$

Since  $m_{uv} = -\frac{1}{m_{vw}}$ ,  $UV \perp VW$  and  $UVWZ$  is a rectangle.

c) Extension: How could we prove that UVWZ is a SQUARE? Search the Distance formula on google and give this a try.

length of line segments

$$V(x_2 - x_1)^2 + (y_2 - y_1)^2 = \sqrt{(-4 - (-1))^2 + (-1 - (-4))^2} = \sqrt{9 + 9} = \sqrt{18}$$

$$W(x_2 - x_1)^2 + (y_2 - y_1)^2 = \sqrt{(-1 - (-4))^2 + (-4 - (-1))^2} = \sqrt{9 + 9} = \sqrt{18}$$

$VW = \sqrt{18}$

OR

$$\overline{WZ} = \sqrt{18}$$

$$a^2 + b^2 = c^2$$

$$3^2 + 3^2 = c^2$$

$$9 + 9 = c^2$$

$$18 = c^2$$

$$\sqrt{18} = c$$

$VW = UV = ZW = WZ$   
 $\therefore$  figure is a square.

Show

13.a)  $HM \parallel JK$  and  $HJ \parallel MK$

How? Get  $m_{HM} = m_{JK}$  &  $m_{HJ} = m_{MK}$

$$m_{HM} = \frac{-3}{1} \text{ (RISE)} \quad m_{JK} = \frac{-3}{1} \text{ (RISE)} \quad \therefore HM \parallel JK.$$

$$m_{HJ} = \frac{2}{7} \quad m_{MK} = \frac{2}{7} \quad \therefore HJ \parallel MK$$

b) No,  $HMJK$  is NOT a rectangle. The slopes are not negative reciprocals.  $\therefore$  the lines are not perpendicular.

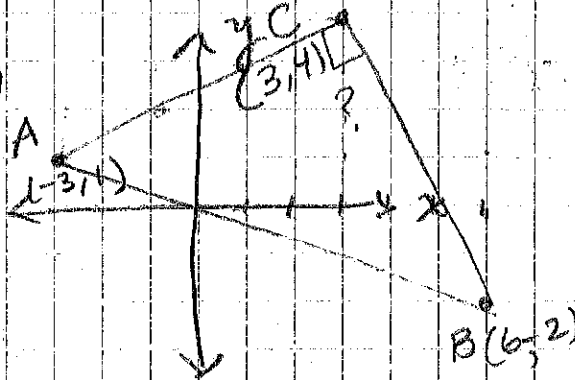
$$\textcircled{14} \quad m_{GD} = \frac{3}{3} = 1 \quad m_{EF} = \frac{4}{4} = 1$$

$$m_{GD} = m_{EF} \quad \therefore GD \parallel EF$$

$$m_{GF} = -5 \quad m_{DE} = \frac{-4}{2} = -2$$

The figure is a trapezoid since it has exactly one pair of parallel lines.

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$$m_{AC} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - 1}{3 - (-3)} = \frac{3}{6} = \frac{1}{2}$$

$$m_{CB} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{2 - 4}{6 - 3} = \frac{-2}{3} = -\frac{2}{3}$$

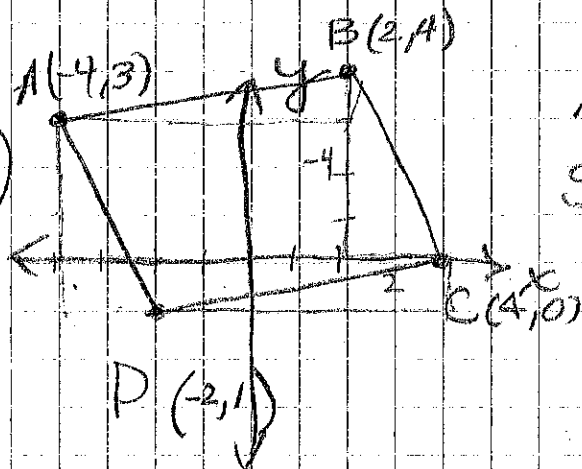
∴ the line AC ⊥ CB and  $\triangle ACB$  is a right  $\triangle$ .

$(x_1, y_1)$   
 $(3, 4)$   
 $(6, 2)$   
 $x_2, y_2$

$$m_{CB} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m_{CB} = \frac{-2 - 4}{6 - 3} = -\frac{6}{3} = -\frac{2}{1}$$

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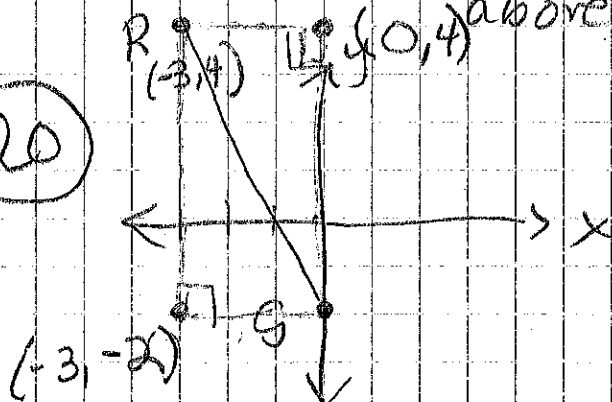


ABCD is a parallelogram,  
 So  $m_{BC} = m_{AD} = -\frac{4}{2}$

$$m_{AB} = m_{DC} = \frac{1}{6}$$

D (-2, 1) It is the only place to satisfy the above slopes.

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2 options : (-3, -2)  
 and (0, 4)