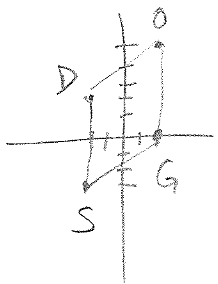
Geometry (H)

Section 5.4 – Special Parallelograms

Directions: Graph each quadrilateral then identify whether it is a: rectangle, rhombus, square, or parallelogram. You must use slope and/or distance to verify.

1. D(-2,2) O(2,5) G(2,0) S(-2,-3)



$d_{\overline{DO}} = \sqrt{(-2-2)^2 + (2-5)^2}$

$\sqrt{16+9} = 5$

$d_{\overline{SG}} = \sqrt{(2--2)^2 + (0--3)^2}$

$\sqrt{16+9} = 5$

$d_{\overline{DS}} = \sqrt{(-2--2)^2 + (2--3)^2}$

$\sqrt{0+25} = 5$

$d_{\overline{OG}} = \sqrt{(2-2)^2 + (5-0)^2}$

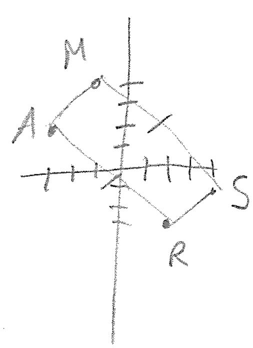
$\sqrt{0+25} = 5$

$m_{\overline{DS}} = \frac{2--3}{-2--2} = \frac{5}{0}$

$m_{\overline{SG}} = \frac{0--3}{2--2} = \frac{3}{4}$

Since all 4 sides are ≅, this is a rhombus. Since the slopes of 2 consecutive sides are not negative reciprocals, the sides are not ⊥, and therefore, not a square.

2. M(-1,4) A(-3,2) R(2, -3) S(4,-1)



$d_{\overline{MS}} = \sqrt{(-1-4)^2 + (4--1)^2}$

$\sqrt{25+25} = \sqrt{2 \cdot 25} = 5\sqrt{2}$

$d_{\overline{AR}} = \sqrt{(-3-2)^2 + (2--3)^2}$

$\sqrt{25+25} = 5\sqrt{2}$

$d_{\overline{MA}} = \sqrt{(-1--3)^2 + (4-2)^2}$

$\sqrt{4+4} = \sqrt{8} = 2\sqrt{2}$

$d_{\overline{SR}} = \sqrt{(2-4)^2 + (-3--1)^2}$

$\sqrt{4+4} = 2\sqrt{2}$

$m_{\overline{MA}} = \frac{4-2}{-1--3} = \frac{2}{2} = 1$

$m_{\overline{SR}} = \frac{-3--1}{2-4} = \frac{-2}{-2} = 1$

$m_{\overline{MS}} = \frac{4--1}{-1-4} = \frac{5}{-5} = -1$

$m_{\overline{AR}} = \frac{2--3}{-3-2} = \frac{5}{-5} = -1$

*Because 4 sides are not ≅, this rules out a square.

① The quad has opp sides parallel and opp sides equal → therefore, it is a ▱.

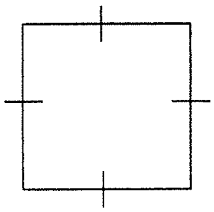
② Since the ▱ has $\overline{MA} \perp \overline{AR}$, $\overline{SR} \perp \overline{MS}$ → 4 right ∠s → a ▱ with 4 right angles is a rectangle.

Geometry (H) Name: KEY

Section ~~5.4~~ – Special Parallelograms

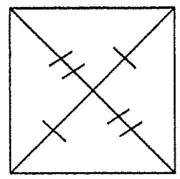
1. Identify the quadrilateral, be as specific as you can. Justify your answer.

a.



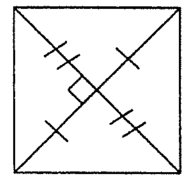
rhombus

b.



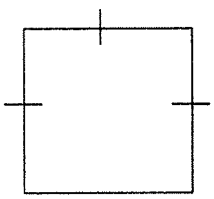
parallelogram

c.



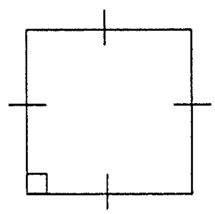
rhombus

d.



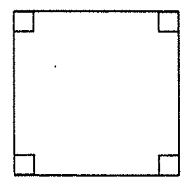
quadrilateral

e.



square

f.



rectangle