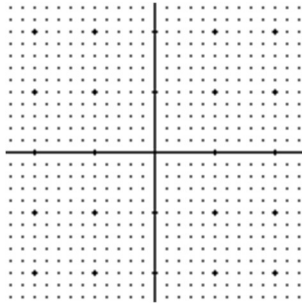


<p>midpoint</p> $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$	<p>(x_2, y_2)</p> $\frac{-(x_1, y_1)}{\text{run, rise}}$	<p>slope</p> $\frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$	<p>distance</p> $\sqrt{\text{run}^2 + \text{rise}^2}$
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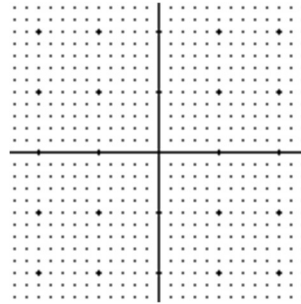
Use midpoint, slope, and distance to prove the **best** name for each quadrilateral.

Quadrilateral, Parallelogram, Rectangle, Rhombus, or Square.

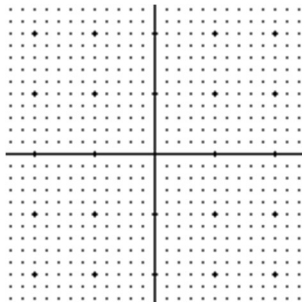
1. $A(3, 2), B(-3, 4), C(-5, -2), D(1, -4)$



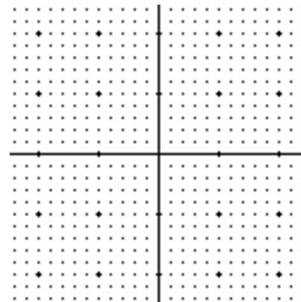
3. $J(0, 1), K(0, -4), L(4, -1), M(4, 4)$



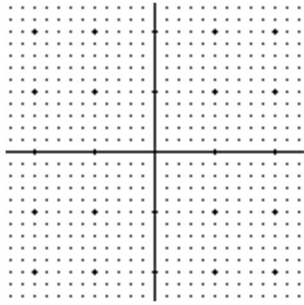
2. $E(-1, 4), F(2, 5), G(7, -1), H(4, -2)$



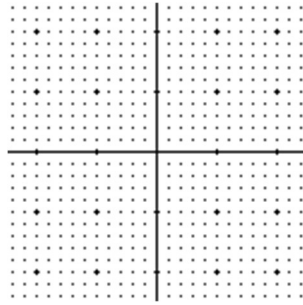
4. $N(5, -1), P(2, 7), Q(-4, 3), R(-1, -6)$



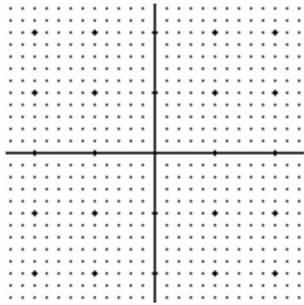
5. $S(-7,3), T(-8,-1), U(0,-3), V(1,1)$



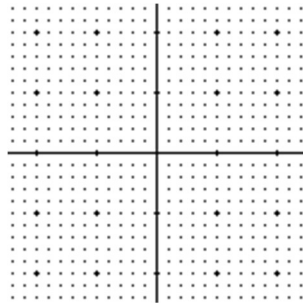
8. $E(1,-4), F(-6,-3), G(-1,2), H(6,1)$



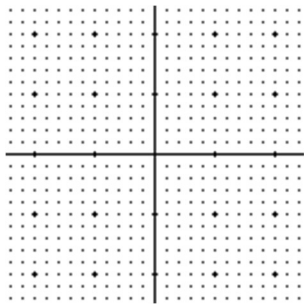
6. $W(3,6), X(-4,0), Y(3,-4), Z(10,2)$



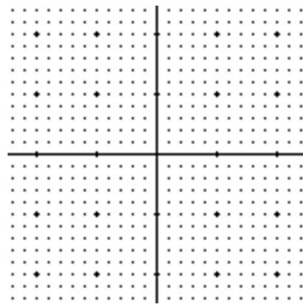
9. $H(-6,4), J(5,8), K(9,-2), L(-3,-5)$



7. $A(7,2), B(-3,-2), C(-7,8), D(3,12)$



10. $M(-1,9), N(-8,-5), P(4,-11), Q(11,3)$

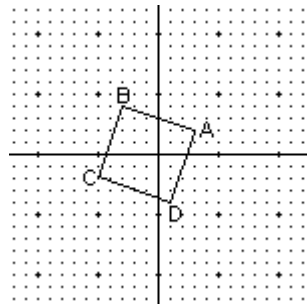


midpoint	(x_2, y_2)	slope	distance
$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$	$\frac{-(x_1, y_1)}{\text{run, rise}}$	$\frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$	$\sqrt{\text{run}^2 + \text{rise}^2}$

Use midpoint, slope, and distance to prove the **best** name for each quadrilateral:

Quadrilateral, Parallelogram, Rectangle, Rhombus, or Square.

1. $A(3, 2), B(-3, 4), C(-5, -2), D(1, -4)$



$$M_{AC} = (-1, 0)$$

$$M_{BD} = (-1, 0)$$

$$m_{AC} = \frac{-8}{-4} = \frac{2}{1}$$

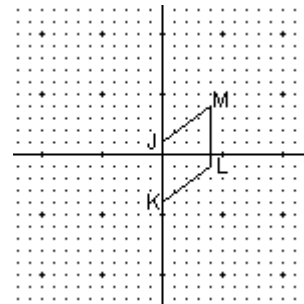
$$m_{BD} = \frac{4}{-8} = -\frac{1}{2}$$

$$d_{AC} = \sqrt{4^2 + 8^2} = \sqrt{80}$$

$$d_{BC} = \sqrt{8^2 + 4^2} = \sqrt{80}$$

square

3. $J(0, 1), K(0, -4), L(4, -1), M(4, 4)$



$$M_{JL} = (2, 0)$$

$$M_{KM} = (2, 0)$$

$$m_{JL} = \frac{4}{-2} = -\frac{2}{1}$$

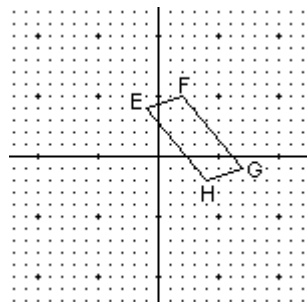
$$m_{KM} = \frac{4}{8} = \frac{1}{2}$$

$$d_{JL} = \sqrt{2^2 + 4^2} = \sqrt{20}$$

$$d_{KM} = \sqrt{8^2 + 4^2} = \sqrt{80}$$

rhombus

2. $E(-1, 4), F(2, 5), G(7, -1), H(4, -2)$



$$M_{EG} = (3, 1.5)$$

$$M_{FH} = (3, 1.5)$$

$$m_{EG} = \frac{-5}{8} = -\frac{5}{8}$$

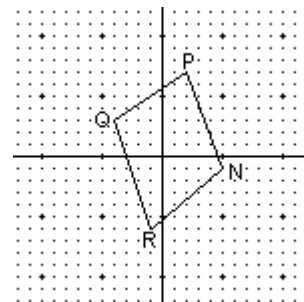
$$m_{FH} = \frac{2}{-7} = -\frac{2}{7}$$

$$d_{EG} = \sqrt{8^2 + 5^2} = \sqrt{89}$$

$$d_{FH} = \sqrt{2^2 + 7^2} = \sqrt{53}$$

parallelogram

4. $N(5, -1), P(2, 7), Q(-4, 3), R(-1, -6)$

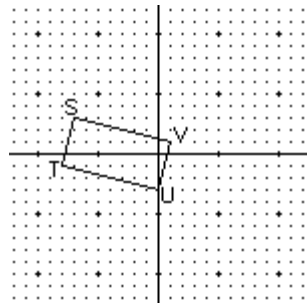


$$M_{NQ} = (0.5, 1)$$

$$M_{PR} = (0.5, 0.5)$$

quadrilateral

5. $S(-7,3), T(-8,-1), U(0,-3), V(1,1)$



$$M_{SU} = (-3.5, 0)$$

$$M_{TV} = (-3.5, 0)$$

$$m_{SU} = \frac{-6}{7} = -\frac{6}{7}$$

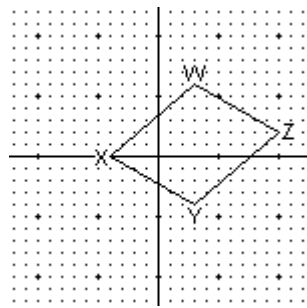
$$m_{TV} = \frac{2}{9}$$

$$d_{SU} = \sqrt{7^2 + 6^2} = \sqrt{85}$$

$$d_{TV} = \sqrt{2^2 + 9^2} = \sqrt{85}$$

rectangle

6. $W(3,6), X(-4,0), Y(3,-4), Z(10,2)$



$$M_{WY} = (3, 1)$$

$$M_{XZ} = (3, 1)$$

$$m_{WY} = \text{undefined}$$

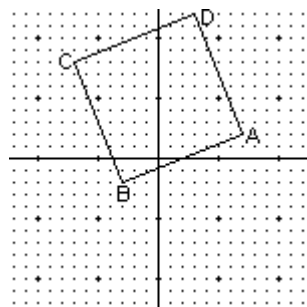
$$m_{XZ} = \frac{2}{6} = \frac{1}{3}$$

$$d_{WY} = \sqrt{0^2 + 6^2} = \sqrt{36}$$

$$d_{XZ} = \sqrt{6^2 + 2^2} = \sqrt{40}$$

parallelogram

7. $A(7,2), B(-3,-2), C(-7,8), D(3,12)$



$$M_{AC} = (0, 5)$$

$$M_{BD} = (0, 5)$$

$$m_{AC} = \frac{-14}{6} = -\frac{7}{3}$$

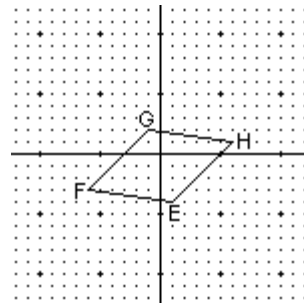
$$m_{BD} = \frac{6}{14} = \frac{3}{7}$$

$$d_{AC} = \sqrt{6^2 + 14^2} = \sqrt{232}$$

$$d_{BD} = \sqrt{14^2 + 6^2} = \sqrt{232}$$

square

8. $E(1,-4), F(-6,-3), G(-1,2), H(6,1)$



$$M_{EG} = (0, -1)$$

$$M_{FH} = (0, -1)$$

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

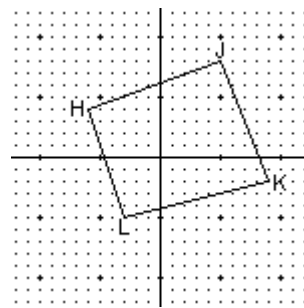
$$m_{FH} = \frac{4}{12} = \frac{1}{3}$$

$$d_{SU} = \sqrt{6^2 + 2^2} = \sqrt{40}$$

$$d_{TV} = \sqrt{12^2 + 4^2} = \sqrt{160}$$

rhombus

9. $H(-6,4), J(5,8), K(9,-2), L(-3,-5)$

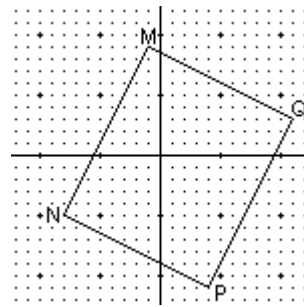


$$M_{HK} = (1.5, 1)$$

$$M_{JL} = (-1, 3)$$

quadrilateral

10. $M(-1,9), N(-8,-5), P(4,-11), Q(11,3)$



$$M_{MP} = (1.5, -1)$$

$$M_{NQ} = (1.5, -1)$$

$$m_{MP} = \frac{-20}{5} = -\frac{4}{1}$$

$$m_{NQ} = \frac{8}{19}$$

$$d_{MP} = \sqrt{5^2 + 20^2} = \sqrt{425}$$

$$d_{NQ} = \sqrt{19^2 + 8^2} = \sqrt{425}$$

rectangle