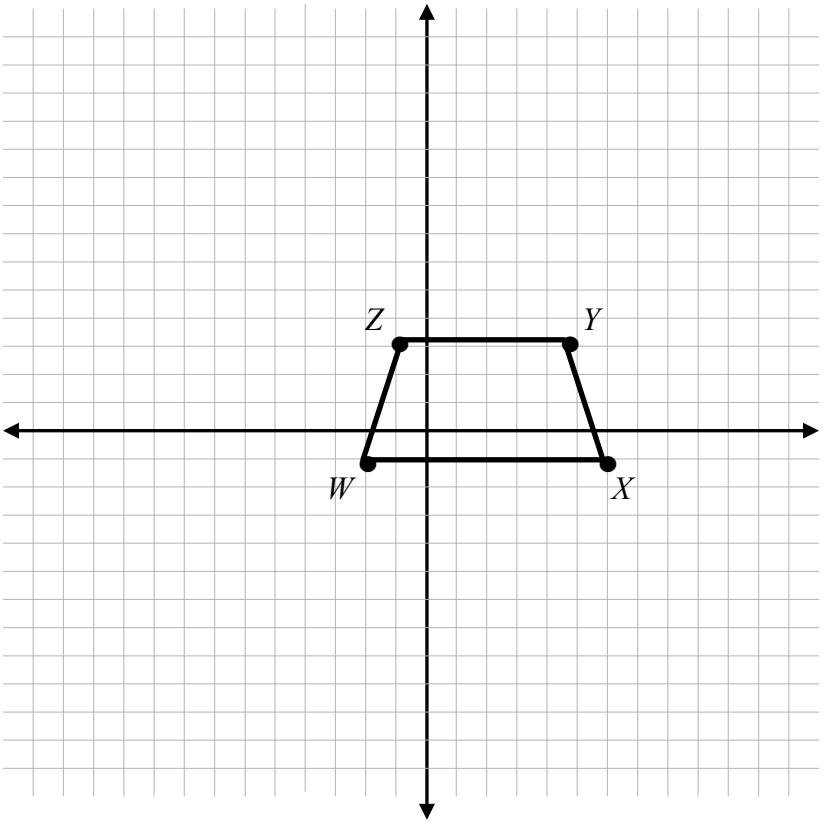
6-5 Coordinate Geometry Practice

EX 1) Determine whether a quadrilateral with vertices $W(-2, -1)$, $X(6, -1)$, $Y(5, 3)$, $Z(-1, 3)$ is a parallelogram. If so, determine whether the parallelogram is a rectangle, rhombus or square. Give <u>all</u> names that apply.



If $\overline{YZ} \parallel \overline{XW}$ and $\overline{WZ} \parallel \overline{XY}$, then *KLMN* is a parallelogram: $m_{\overline{YZ}} = 0$ and $m_{\overline{XW}} = 0$

$\overline{YZ} \parallel \overline{XW}$

$m_{\overline{WZ}} = 4$ and $m_{\overline{XY}} = -4$

$\overline{WZ} \nparallel \overline{XY}$

WXYZ is ***not*** a parallelogram (it's a trapezoid)

Name for *WXYZ*: quadrilateral

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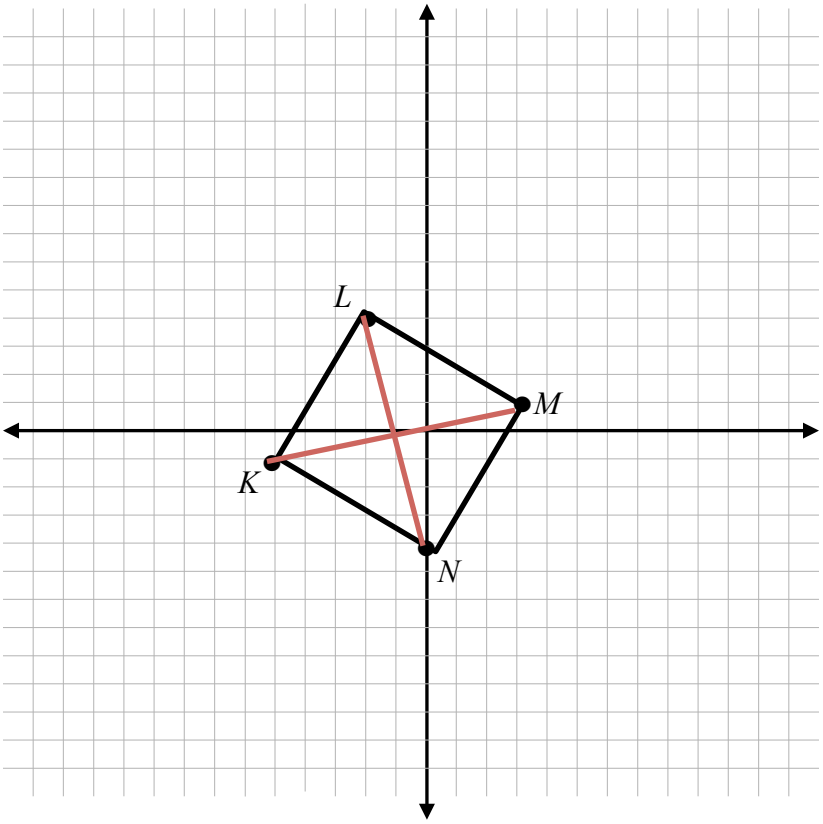
EX 2) Use the **diagonals** to determine whether a ***parallelogram*** with vertices $K(-5, -1)$, $L(-2, 4)$, $M(3, 1)$, $N(0, -4)$ is a rectangle, rhombus or square. Give all names that apply.



If $\overline{LN} \cong \overline{KM}$, then $KLMN$ is a rectangle: $d_{\overline{LN}} = 2\sqrt{17}$ and $d_{\overline{KM}} = 2\sqrt{17}$

$\overline{LN} \cong \overline{KM}$

$\therefore KLMN$ is a rectangle

If $\overline{LN} \perp \overline{KM}$, then $KLMN$ is a rhombus: $m_{\overline{LN}} = -4$ and $m_{\overline{KM}} = \frac{1}{4}$

$\overline{LN} \perp \overline{KM}$

$\therefore KLMN$ is a rhombus

Since $KLMN$ is a rectangle and a rhombus, $KLMN$ is a square.

Names for $KLMN$: quadrilateral, parallelogram, rectangle, rhombus, square

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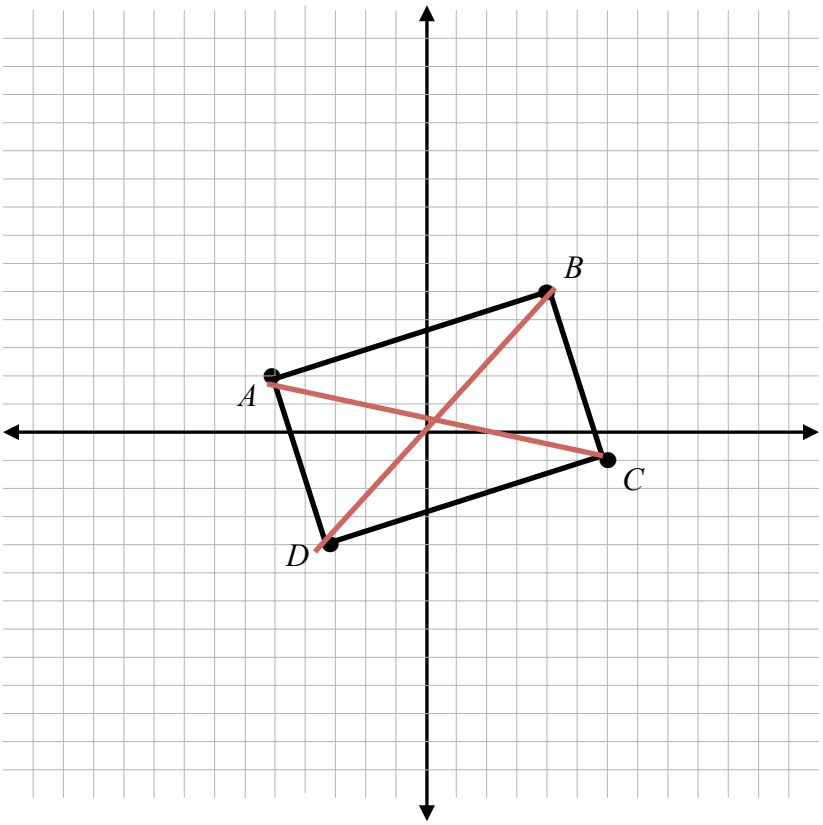
EX 3) Determine whether a ***parallelogram*** with vertices $A(-5, 2)$, $B(4, 5)$, $C(6, -1)$, $D(-3, -4)$ is a rectangle, rhombus or square. Give all names that apply.



If $\overline{AC} \cong \overline{BD}$, then $ABCD$ is a rectangle: $d_{\overline{AC}} = \sqrt{130}$ and $d_{\overline{BD}} = \sqrt{130}$

$\overline{AC} \cong \overline{BD}$

$\therefore ABCD$ is a rectangle

If $\overline{AC} \perp \overline{BD}$, then $ABCD$ is a rhombus: $m_{\overline{AC}} = -\frac{3}{11}$ and $m_{\overline{BD}} = \frac{9}{7}$

$\overline{AC} \not\perp \overline{BD}$

$\therefore ABCD$ is a not a rhombus

$ABCD$ is a rectangle

Names for $ABCD$: quadrilateral, parallelogram, rectangle

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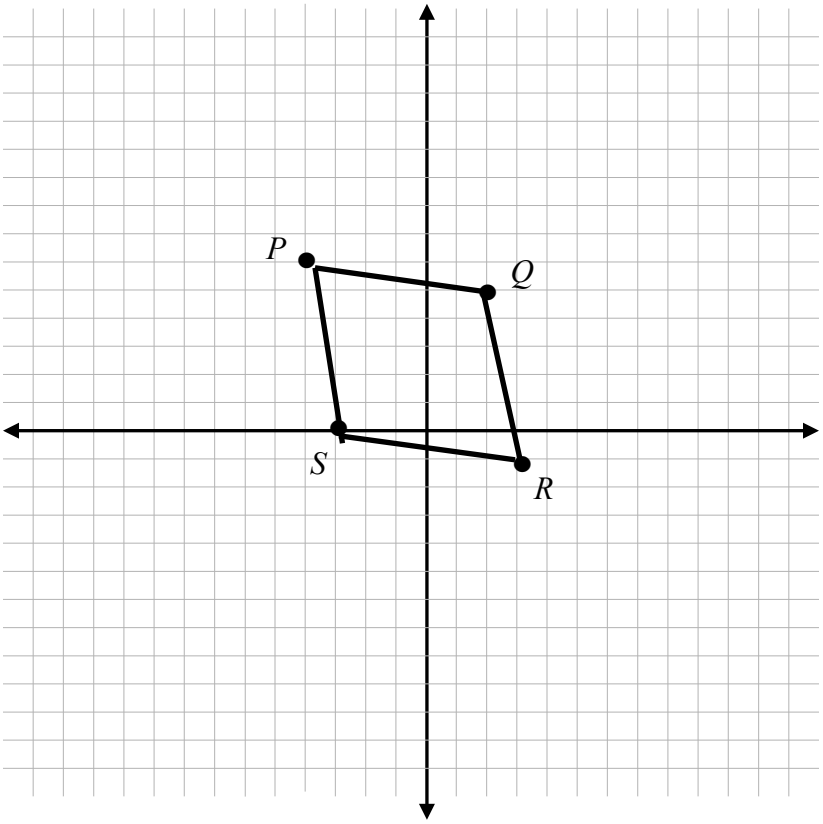
EX 4) Determine whether a quadrilateral with vertices $P(-4, 6)$, $Q(2, 5)$, $R(3, -1)$, $S(-3, 0)$ is a rectangle, rhombus or square. Give all names that apply.



If $\overline{PQ} \parallel \overline{SR}$ and $\overline{PS} \parallel \overline{QR}$, then $PQRS$ is a parallelogram:

$m_{\overline{PQ}} = -\frac{1}{6}$ and $m_{\overline{SR}} = -\frac{1}{6}$

$\overline{PQ} \parallel \overline{SR}$

$m_{\overline{PS}} = -6$ and $m_{\overline{QR}} = -6$

$\overline{PS} \parallel \overline{QR}$

$\therefore PQRS$ is a parallelogram

If $\overline{PR} \cong \overline{QS}$, then $PQRS$ is a rectangle:

$d_{\overline{PR}} = 7\sqrt{2}$ and $d_{\overline{QS}} = 5\sqrt{2}$

$\overline{PR} \ncong \overline{QS}$

$\therefore PQRS$ is not a rectangle

If $\overline{PR} \perp \overline{QS}$, then $PQRS$ is a rhombus:

$m_{\overline{PR}} = -1$ and $m_{\overline{QS}} = 1$

$\overline{PR} \perp \overline{QS}$

$\therefore PQRS$ is a rhombus

$PQRS$ is a rhombus

Names for $PQRS$: quadrilateral, parallelogram, rhombus