Name:_____ Quadrilaterals in the Coordinate Plane

BEAR Quadrilateral

B(-1,4), E(2,5), A(3,2), R(0,1)

Calculate the length and slope of each side and from these calculations only determine what type of quadrilateral BEAR is.

SQUARE

$\overline{BE} = \sqrt{(-1-2)^2 + (4-5)^2} = \sqrt{(-3)^2+(-1)^2} = \sqrt{9+1} = \sqrt{10}$

$\overline{EA} = \sqrt{(2-3)^2 + (5-2)^2} = \sqrt{(-1)^2+(3)^2} = \sqrt{1+9} = \sqrt{10}$

$\overline{AR} = \sqrt{(3-0)^2 + (2-1)^2} = \sqrt{3^2+1^2} = \sqrt{9+1} = \sqrt{10}$

$\overline{RB} = \sqrt{(-1-0)^2 + (4-1)^2} = \sqrt{(-1)^2+3^2} = \sqrt{1+9} = \sqrt{10}$

slope $\overline{BE} \rightarrow \frac{5-4}{2+1} = \frac{1}{3}$

slope $\overline{EA} \rightarrow \frac{2-5}{3-2} = \frac{-3}{1}$

slope $\overline{AR} \rightarrow \frac{1-2}{0-3} = \frac{-1}{-3} = \frac{1}{3}$

slope $\overline{RB} \rightarrow \frac{1-4}{0+1} = \frac{-3}{1}$

OHMY Quadrilateral

O(-1,4), H(2,3), M(4,-3), Y(1,-2)

Calculate the length and slope of each side and from these calculations only determine what type of quadrilateral OHMY is.

Rhombus

$\overline{OH} = \sqrt{(2+1)^2 + (3-4)^2} = \sqrt{3^2+(-1)^2} = \sqrt{9+1} = \sqrt{10}$ ✓ not 90°

$\overline{HM} = \sqrt{(-3-3)^2 + (4-2)^2} = \sqrt{(-6)^2+(2)^2} = \sqrt{36+4} = \sqrt{40}$

$\overline{MY} = \sqrt{(4-1)^2 + (-3+2)^2} = \sqrt{3^2+(-1)^2} = \sqrt{9+1} = \sqrt{10}$ ✓

$\overline{OY} = \sqrt{(-1-1)^2 + (4+2)^2} = \sqrt{(-2)^2+6^2} = \sqrt{4+36} = \sqrt{40}$

Slopes → $\overline{OH}$ $\frac{3-4}{2+1}$ $\frac{-1}{3}$ | $\overline{HM}$ $\frac{-3-3}{4-2}$ $\frac{-6}{2} = \frac{-3}{1}$ | $\overline{MY}$ $\frac{-2+3}{1-4}$ $\frac{+1}{-3} = \frac{1}{3} = \frac{-1}{3}$ | $\overline{OY}$ $\frac{-2-4}{1+1} = \frac{-6}{2} = \frac{-3}{1}$

∴

Name:_____ Quadrilaterals in the Coordinate Plane

WZRD Quadrilateral

W(0,3), Z(5,3), R(8,-1), D(3,-1)

Calculate the **length, slope, and midpoints** of the two DIAGONALS and from these calculations only determine what type of quadrilateral WZRD is.

$\overline{WR} = \sqrt{(-1-3)^2+(8-0)^2} = \sqrt{(-4)^2+8^2} = \sqrt{16+64} = \sqrt{80}$

$\overline{ZD} = \sqrt{(-1-3)^2+(3-5)^2} = \sqrt{(-4)^2+(-2)^2} = \sqrt{16+4} = \sqrt{20}$

Slope $\overline{WR}$: $\frac{-1-3}{8-0} = \frac{-4}{8} = -\frac{1}{2}$

Slope $\overline{ZD}$: $\frac{-1-3}{3-5} = \frac{-4}{-2} = \frac{2}{1}$

mdpt $\overline{WR}$: $(\frac{8}{2}, \frac{2}{2}) = (4,1)$

Mdpt $\overline{ZD}$: $(\frac{8}{2}, \frac{2}{2}) = (4,1)$

$\neq$ diagonals

$\perp$ diagonals

Rhombus

Rhombus ~~Square~~

AHSZ Quadrilateral

A(-2,1), H(2,2), S(5,-4), Z(1,-5)

Calculate the **length, slope, and midpoints** of the two DIAGONALS and from these calculations only determine what type of quadrilateral AHSZ is.

~~$\overline{AH} = \sqrt{(2-1)^2+(2+2)^2} = \sqrt{1^2+4^2} = \sqrt{1+16} = \sqrt{17}$~~

$\overline{AS} = \sqrt{(-4-1)^2+(5+2)^2} = \sqrt{(-5)^2+7^2} = \sqrt{25+49} = \sqrt{74}$

$\overline{HZ} = \sqrt{(-5-2)^2+(1-2)^2} = \sqrt{(-7)^2+(-1)} = \sqrt{49+1} = \sqrt{50}$

Slope: $\overline{AS} \rightarrow \frac{-4-1}{5+2} = \frac{-5}{7}$

$\overline{HZ} \rightarrow \frac{-5-2}{1-2} = \frac{-7}{1}$

$\neq$ ~~sides~~ diagonals

$\neq$ Slopes

Same Midpoint diagonal

Mdpt: $\overline{AS} \rightarrow (\frac{3}{2}, \frac{-3}{2})$ mdpt $\overline{HZ} \rightarrow (\frac{3}{2}, \frac{-3}{2})$

Parallelogram