Bellwork Geo Monday, February 10, 2020

Use coordinate geometry to find the most precise name for each quadrilateral.

1. Quadrilateral $EFGH$

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

2. Quadrilateral $WXYZ$

$W(-4,3)$
$X(5,6)$
$Y(7,0)$
$Z(-2,-3)$

ANSWERS

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1. Quadrilateral *EFGH*

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midpts of diagonals

EG: $\left(\frac{7+-2}{2}, \frac{4+2}{2}\right) = \left(\frac{5}{2}, 3\right)$

FH: $\left(\frac{-1+2}{2}, \frac{-2+5}{2}\right) = \left(\frac{1}{2}, \frac{3}{2}\right)$

NOT a ‖-gram b/c diagonals don't bisect each other.

Slope of sides

EF $m = \frac{4--2}{7--1} = \frac{6}{8} = 3/4$

FG $m = \frac{2--2}{-2--1} = \frac{4}{-1} = -4$

GH $m = \frac{5-2}{2--2} = 3/4$

HE $m = \frac{5-4}{2-7} = \frac{1}{-5}$

EFGH is a trapezoid b/c 1 pair sides is parallel

Length of non-‖ sides (legs)

$FG = \sqrt{(-1--2)^2 + (-2-2)^2}$
$= \sqrt{1^2 + (-4)^2}$
$= \sqrt{17}$

$HE = \sqrt{(7-2)^2 + (4-5)^2}$
$= \sqrt{5^2 + (-1)^2}$
$= \sqrt{26}$

NOT AN Isosceles trapezoid because legs are not $\cong$

EFGH IS A TRAPEZOID

2. Quadrilateral *WXYZ*

$W(-4,3)$
$X(5,6)$
$Y(7,0)$
$Z(-2,-3)$

midpts of diagonals

WY: $\left(\frac{7+-4}{2}, \frac{0+3}{2}\right) = \left(\frac{3}{2}, \frac{3}{2}\right)$

XZ: $\left(\frac{5+-2}{2}, \frac{6+-3}{2}\right) = \left(\frac{3}{2}, \frac{3}{2}\right)$

WXYZ is a ‖-gram b/c diag bisect each other

Slope of diagonals

WY $m = \frac{3-0}{-4-7} = \frac{3}{-11}$

XZ $m = \frac{6--3}{5--2} = \frac{9}{7}$

WXYZ is NOT a Rhombus b/c diagonals not $\perp$

Length of diagonals

$WY = \sqrt{(7--4)^2 + (0-3)^2}$
$= \sqrt{11^2 + (-3)^2} = \sqrt{130}$

$XZ = \sqrt{(5--2)^2 + (6--3)^2}$
$= \sqrt{7^2 + 9^2} = \sqrt{130}$

WXYZ is a Rectangle b/c diagonals are $\cong$

WXYZ is a Rectangle