Honors Geometry

Coordinate Plane Geometry Practice

Name _____

Date _____ Pd:____

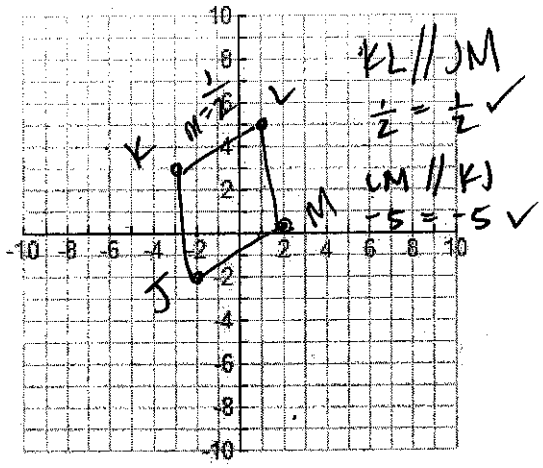
Properties.

1. How can you prove sides or diagonals are congruent in a coordinate plane? distance
2. How can you prove that sides are parallel in a coordinate plane? slope
3. How can you prove that diagonals bisect in a coordinate plane? Midpoint
4. How can you prove that diagonals are perpendicular in a coordinate plane? slope

Show that the quadrilateral with the given vertices is a parallelogram using the given definition or theorem.

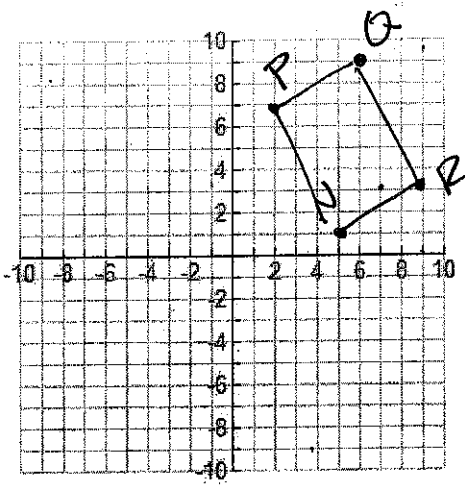
5. J (-2, -2), K (-3, 3), L (1, 5), M (2, 0)

Both pairs of opposite sides are parallel.



6. N (5, 1), P (2, 7), Q(6, 9), R (9, 3)

Both pairs of opposite sides are congruent.



$\overline{PQ} \cong \overline{NR}$ AND $\overline{QR} \cong \overline{PN}$

$d = \sqrt{(9-7)^2+(6-2)^2} = \sqrt{20}$ ✓

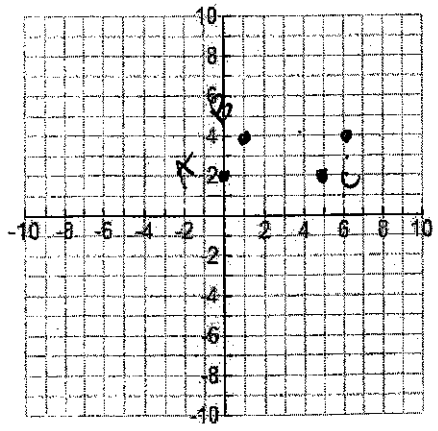
$d = \sqrt{(3-1)^2+(9-5)^2} = \sqrt{20}$ ✓

$d = \sqrt{(3-9)^2+(9-6)^2} = \sqrt{45}$ ✓

$d = \sqrt{(7-1)^2+(2-5)^2} = \sqrt{45}$ ✓

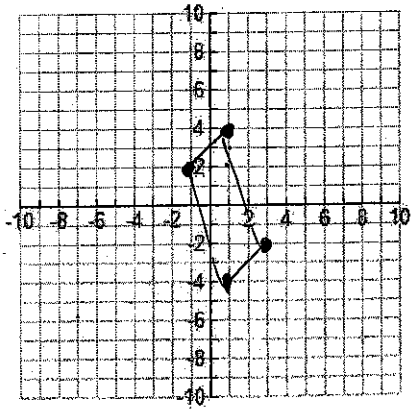
Use the given points of parallelogram ABCD to find the missing point of the parallelogram.

7. A (0, 2), B(1, 4), C (5, 2), D (?, ?)



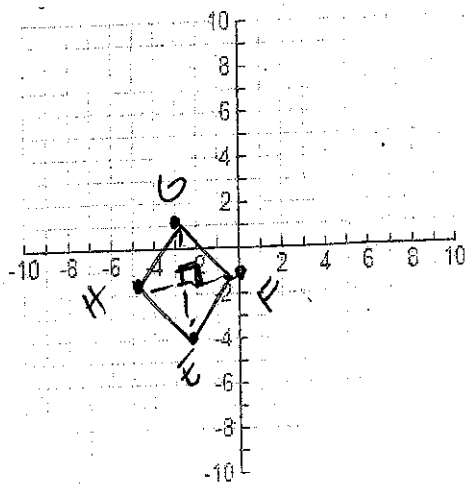
D (6,4)

8. A (?, ?), B (1, 4), C (3, -2), D (1, -4)



A(-1, 2)

Find the lengths and slopes of the diagonals to determine whether a parallelogram with the given vertices is a rectangle, rhombus, or square.



9. E (-2. -4), F (0, -1), G (-3, 1), H (-5, -2)

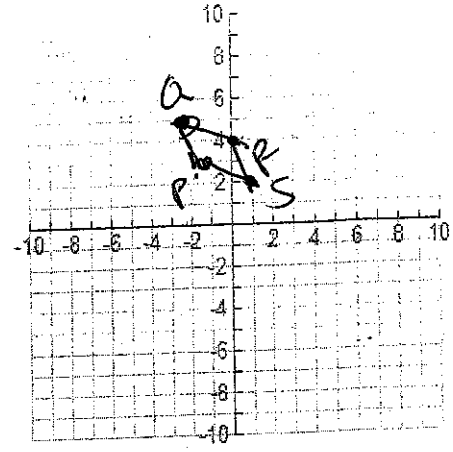
EG= $\sqrt{26}$ FH = $\sqrt{13}$

Slope of $\overline{EG}$ = -5 slope of $\overline{FH}$ = $\frac{1}{5}$

Special parallelogram: Rhombus

$EG\ d=\sqrt{(1+4)^2+(-3+2)^2}=\sqrt{26}$ $\quad m=\frac{1+4}{-3+2}=\frac{5}{-1}$

$FH\ d=\sqrt{(-2+4)^2+(-5+2)^2}=\sqrt{13}$ $\quad m=\frac{-2+1}{-5+0}=\frac{-1}{-5}=\frac{1}{5}$



10. P (-1, 3), Q (-2, 5), R (0, 4), S (1, 2)

PR = $\sqrt{2}$ QS = $4\sqrt{2}$

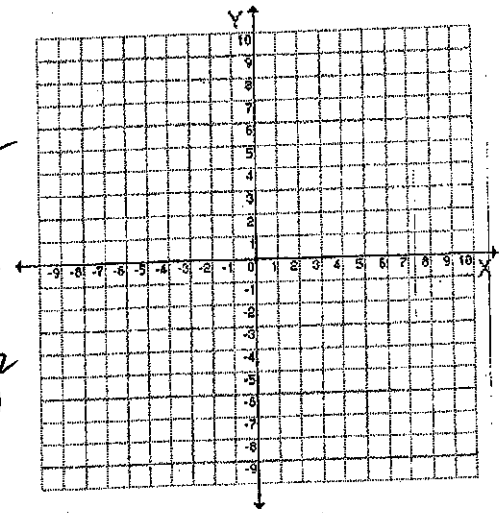
Slope of $\overline{PR}$ = 1 slope of $\overline{QS}$ = -1

Special parallelogram: Rhombus

$PR\ d=\sqrt{(4-3)^2+(0+1)^2}=\sqrt{2}$ $\quad m=\frac{4-3}{0+1}=\frac{1}{1}$

$QS\ d=\sqrt{(2+2)^2+(1-5)^2}=\sqrt{32}=4\sqrt{2}$ $\quad m=\frac{2-5}{1+2}=\frac{-3}{3}$

1. Triangle *DAN* has coordinates *D*(−10, 4), *A*(−4, 1), and *N*(−2, 5). Using coordinate geometry, prove that triangle *DAN* is a right triangle.



$DA=\sqrt{(4-1)^2+(-10+4)^2}=\sqrt{45}$ $\quad (\sqrt{45})^2$

$AN=\sqrt{(5-1)^2+(-2+4)^2}=\sqrt{20}$ $\quad +$ $(\sqrt{20})^2$

$DN=\sqrt{(4-5)^2+(-10+2)^2}=\sqrt{65}$ $\quad =$ $(\sqrt{65})^2$

$45+20=65$ ✓