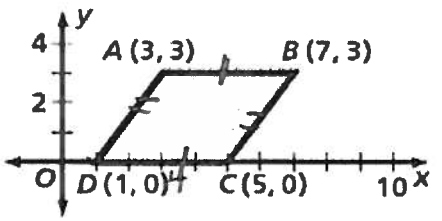
Geometry – Graphing Quadrilateral Name Key

Problems 1-8: Determine the most precise name for each quadrilateral. Justify that the quadrilateral is that type by stating how you know and the calculations used. Be sure to show your work and record your thoughts as complete sentences.
For example: *The quadrilateral is a square because all four sides are equal and all angles are right angles. Each side has a length of $\sqrt{35}$, and the slopes of the adjacent sides are -2 and ½.*
Problems 1 and 2 are graphed for you, but be sure to graph the others.

1.



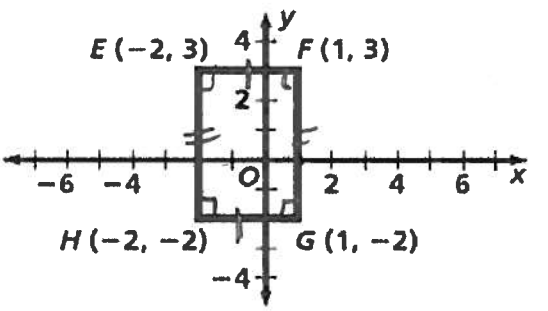
$\overline{AB} = 4$
$\overline{BC} = \sqrt{13}$
$\overline{CD} = 4$
$\overline{DA} = \sqrt{13}$
$\overline{AB} \cong \overline{CD}$
$\overline{BC} \cong \overline{DA}$
Slope $\overline{AB}$: 0
slope $\overline{BC}$: $\frac{3}{2}$
not ⊥

$\overline{BC} = \sqrt{(7-5)^2 + (3-0)^2}$
$\sqrt{2^2+3^2}$
$\sqrt{9+9} = \sqrt{13}$

$\overline{DA} = \sqrt{(1-3)^2 + (0-3)^2}$
$= \sqrt{2^2+3^2}$
$= \sqrt{4+9} = \sqrt{13}$

parallelogram

2.



$\overline{EF} = 3$
$\overline{FG} = 5$
$\overline{GH} = 3$
$\overline{HE} = 5$
$\overline{EF} \cong \overline{GH}$
$\overline{FG} \cong \overline{HE}$

Slope $\overline{EF}$: 0
Slope $\overline{HG}$: 0
Slope $\overline{EH}$: undefined
Slope $\overline{FG}$: undefined
$\overline{EF} \parallel \overline{HG}$
$\overline{EH} \parallel \overline{FG}$
$\overline{EF} \perp \overline{FG}$
$\overline{EH} \perp \overline{HG}$

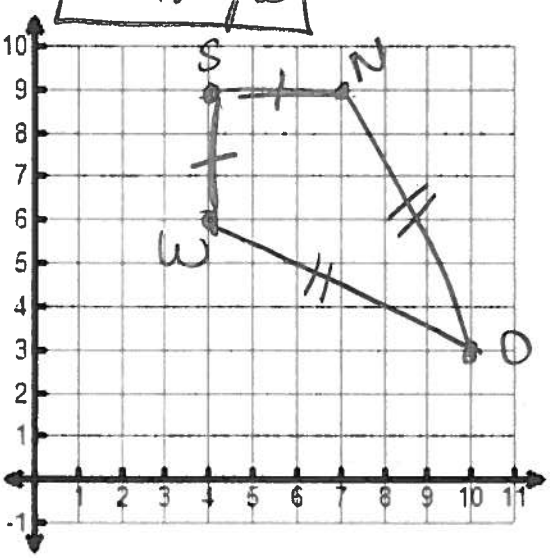
Rectangle

3.

S (4, 9) N (7, 9) O (10, 3) W (4, 6)

$\overline{SW} = 3$
$\overline{SN} = 3$

$\overline{WO} = \sqrt{(4-10)^2 + (6-3)^2} = \sqrt{36+9}$
$\overline{NO} = \sqrt{(7-10)^2 + (9-3)^2}$ $\sqrt{45}$
$\sqrt{3^2+6^2} = \sqrt{9+36} = \sqrt{45}$



Kite

4.

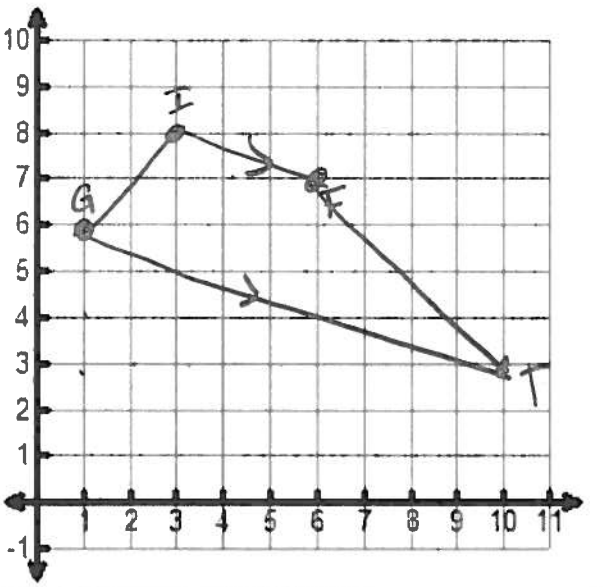
G (1, 6) I (3, 8) F (6, 7) T (10, 3)

Slope $\overline{IF}$: $-\frac{1}{3}$

Slope $\overline{GT}$: $\frac{-3}{9} = -\frac{1}{3}$

$\overline{IF} \parallel \overline{GT}$

Trapezoid



5.

G (-7, -6) I (-6, -2) V (-3, -2) E (-2, -6)

Slope $\overline{IV}$: 0

Slope $\overline{GE}$: 0

$\overline{IV} \parallel \overline{GE}$

$\overline{IG} = \sqrt{(-7+6)^2 + (-6+2)^2}$

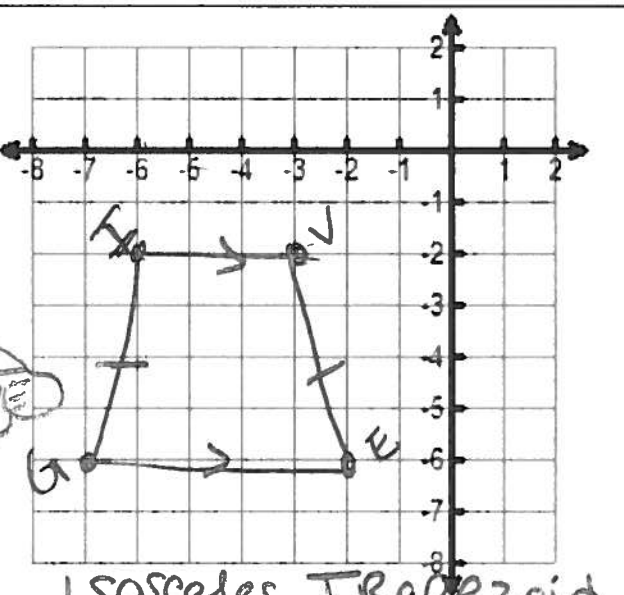
$\sqrt{(-1)^2 + (-4)^2}$

$\sqrt{1+16} = \sqrt{17}$

$\overline{IG} \cong \overline{VE}$

$\overline{VE} = \sqrt{(-3+2)^2 + (-2+6)^2}$

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



Isosceles Trapezoid

6.

S (-7, 1) L (-3, 2) E (-1, -6) D (-6, -7)

$\overline{SL} = \sqrt{(-7+3)^2 + (1-2)^2} = \sqrt{4^2+1^2}$

$= \sqrt{17}$

$\overline{DE} = \sqrt{(-1+6)^2 + (-6+7)^2} = \sqrt{5^2+1^2}$

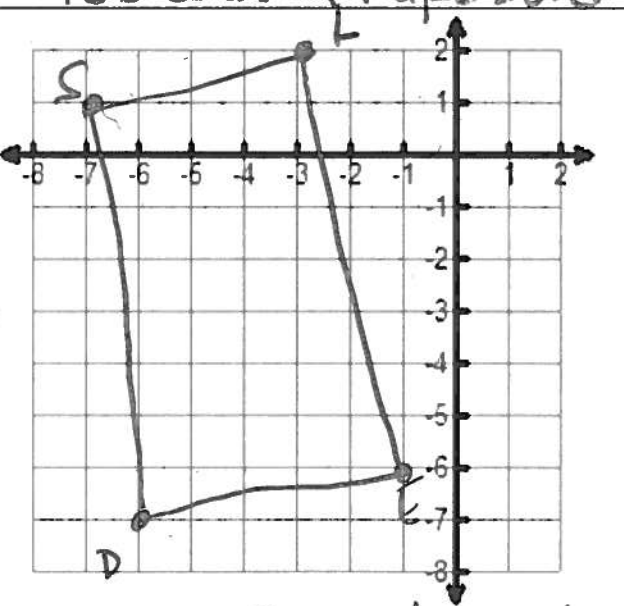
$\sqrt{25+1} = \sqrt{26}$

$\overline{SD} = \sqrt{(-7+6)^2 + (1+7)^2}$

$\sqrt{1^2+8^2} = \sqrt{1+64} = \sqrt{65}$

$\overline{LE} = \sqrt{(-3+1)^2 + (2+6)^2}$

$\sqrt{2^2+8^2} = \sqrt{4+64} = \sqrt{68}$



Slope of . . .

$\overline{SL} \rightarrow \frac{1}{4}$ $\overline{SD} \rightarrow \frac{-8}{1}$

$\overline{DE} \rightarrow \frac{1}{5}$ $\overline{LE} \rightarrow \frac{-8}{2} = -4$

Quadrilateral

7.

E (3, 8) L (6, 10) M (8, 7) O (5, 5)

$\overline{EL} = \sqrt{(3)^2 + (2)^2} = \sqrt{9+4} = \sqrt{13}$

$\overline{LM} = \sqrt{2^2 + 3^2} = \sqrt{13}$

$\overline{MO} = \sqrt{3^2 + 2^2} = \sqrt{13}$

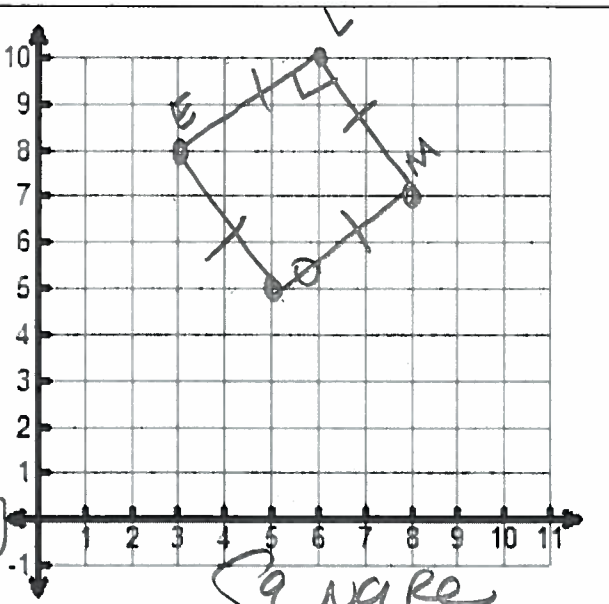
$\overline{EO} = \sqrt{2^2 + 3^2} = \sqrt{13}$

Slope $\overline{EL}$: $\frac{2}{3}$

Slope $\overline{LM}$: $\frac{-3}{2}$

$\overline{EL} \perp \overline{LM}$

$\overline{EL} \cong \overline{LM} \cong \overline{MO} \cong \overline{EO}$



Square

8.

D (1, 5) O (5, 9) R (6, 6) A (2, 2)

$\overline{DO} = \sqrt{4^2 + 4^2} = \sqrt{32}$

$\overline{OR} = \sqrt{1^2 + 3^2} = \sqrt{10}$

$\overline{RA} = \sqrt{4^2 + 4^2} = \sqrt{32}$

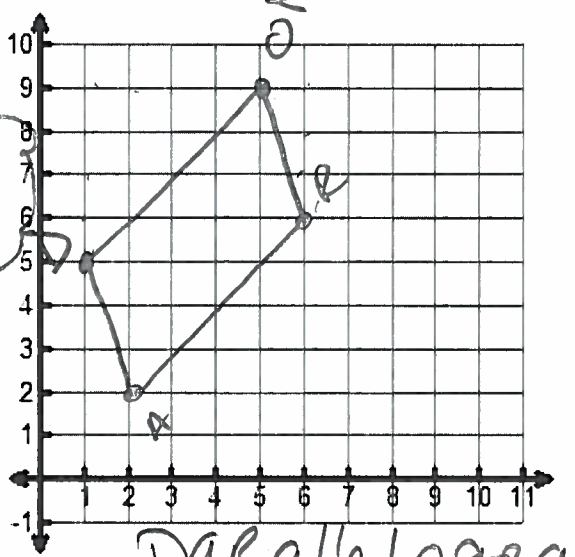
$\overline{DA} = \sqrt{1^2 + 3^2} = \sqrt{10}$

$\overline{DO} \cong \overline{RA}$

$\overline{OR} \cong \overline{DA}$

Slope $\overline{DO}$: $\frac{4}{4} = 1$ not $\frac{1}{2}$

Slope $\overline{OR}$: $\frac{-3}{1} = -3$



Parallelogram

Determine the most precise name for each quadrilateral with the given vertices.

12. $A(1, 4), B(3, 5), C(6, 1), D(4, 0)$

Parallelogram

13. $W(0, 5), X(3, 5), Y(3, 1), Z(0, 1)$

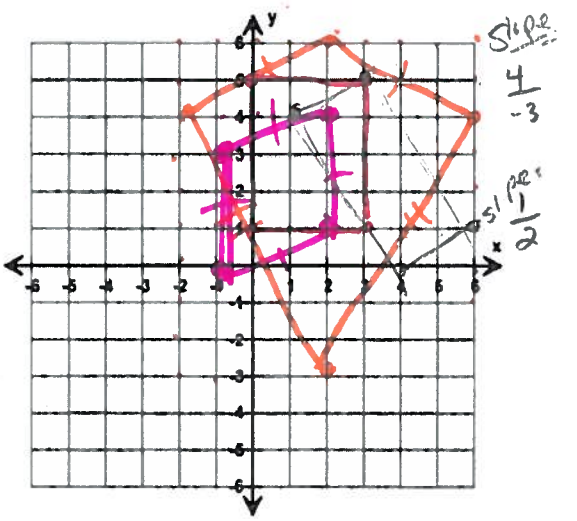
Rectangle

14. $A(-2, 4), B(2, 6), C(6, 4), D(2, 3)$

Kite

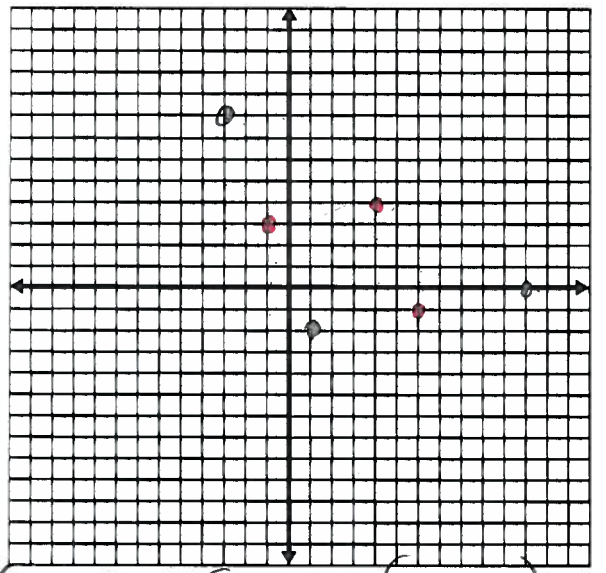
15. $P(-1, 0), Q(-1, 3), R(2, 4), S(2, 1)$

Rhombus



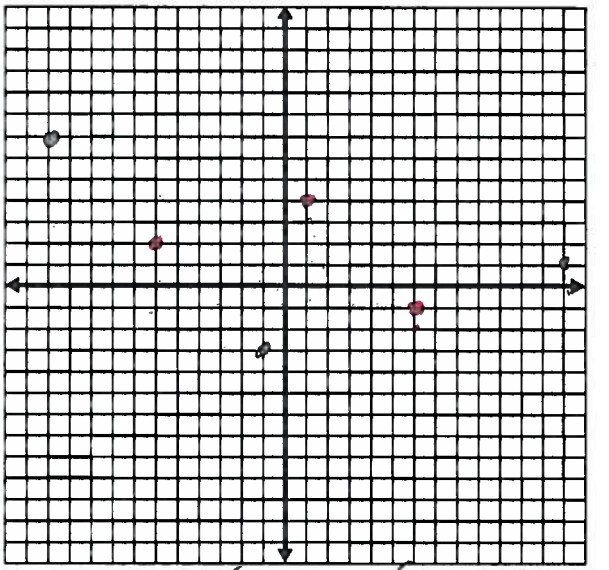
Plot the following 3 points on the graph paper. Give the location of 3 other points that could be the fourth point of the parallelogram.

16. (-1,3), (4,4), (6,-1)



(1,-2), (11,0), (-3,8)

17. (-6,2), (1,4), (6,-1)



(-1,-3), (13,1), (-11,7)

Given the name of the quadrilateral, find the fourth point needed to complete the picture.

18. Isosceles trapezoid – (-2,4), (3,6), (3,-1), (-2,1)
19. Square – (-2,3), (1,8), (3,0), (6,5)
20. Kite – (-3,6), (2,6), (6,-3), (-3,1)
21. Rhombus – (-3,4), (-5,1), (-1,1), (1,4)
22. Rectangle – (-6,1), (3,7), (7,1), (-10,7)