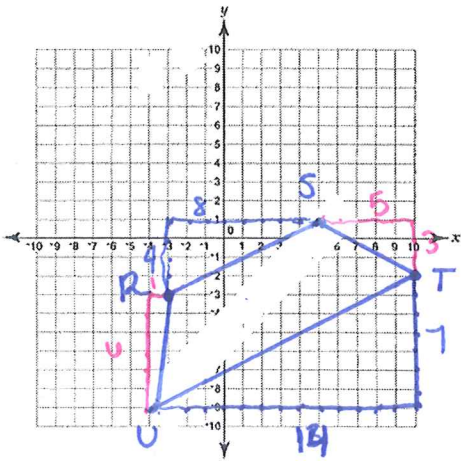Name: **Key**   Date: _____ Hour: _____

Coordinate Classification Practice

Determine whether the figure is a trapezoid, a parallelogram, a square, a rhombus or a general quadrilateral given the vertices

1. $R(-3, -3)$, $S(5, 1)$, $T(10, -2)$, $U(-4, -9)$

Slope $RS = \frac{4}{8} = \frac{1}{2}$

Slope $UT = \frac{7}{14} = \frac{1}{2}$

$RS // UT$

Slope $ST = -\frac{3}{5}$

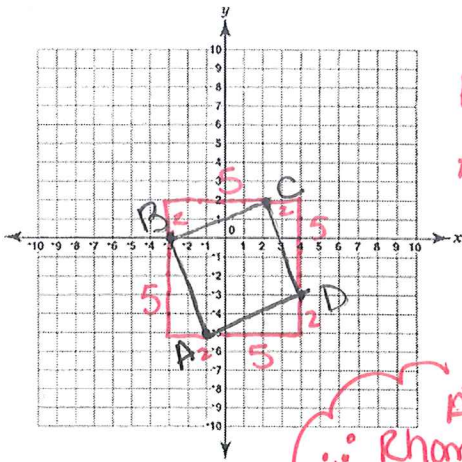Slope $RU = \frac{6}{1} = 6$

$ST \times RU$

$ST^2 = 5^2 + 3^2$

$\boxed{ST = \sqrt{34}}$

$RU^2 = 1^2 + 6^2$

$\boxed{RU = \sqrt{37}}$

Because $RS // UT$ and $ST \times RU$, RSTU only has one pair of op. sides // and $ST \neq RU$ ∴ RSTU is a trapezoid by def.

2. $A(-1, -5)$, $B(-3, 0)$, $C(2, 2)$, $D(4, -3)$

$AB^2 = 2^2 + 5^2$

$AB = \sqrt{29}$

$BC = \sqrt{29}$

$CD = \sqrt{29}$

$AD = \sqrt{29}$

$AB \cong BC \cong CD \cong AD$ ∴ Rhombus

Slope $AB = -\frac{5}{2}$ ⟩ ⊥

Slope $BC = \frac{2}{5}$ ⟩ ⊥

Slope $CD = -\frac{5}{2}$ ⟩ ⊥

Slope $AD = \frac{2}{5}$ ⟩ ⊥ ∴ Rectangle

Opposite sides are parallel ∴ parallelogram by def

Consecutive sides are ⊥

$AB \cong BC \cong CD \cong AD$ and consecutive sides are ⊥ ∴ ABCD is a square.

3. $A(-4, -3)$, $B(3, -3)$, $C(6, 4)$, $D(-7, 4)$
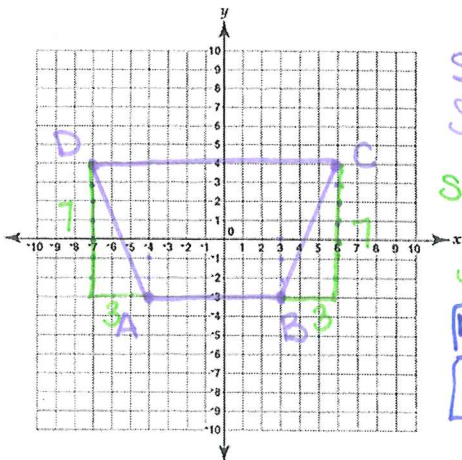
Slope $DC = 0$ ⟩ $DC // AB$
Slope $AB = 0$

Slope $AD = -\frac{7}{3}$ ⟩ $AD \times CB$
Slope $CB = \frac{7}{3}$

$\boxed{DC = 13}$
$\boxed{AB = 7}$

$AD^2 = 3^2 + 7^2$
$\boxed{AD = \sqrt{58}}$

$CB^2 = 3^2 + 7^2$ ⟩ $AD \cong CB$
$\boxed{CB = \sqrt{58}}$

$DC // AB$, $AD \times CB$ and $AD \cong CB$ ∴ ABCD has only one pair of op. sides // and the non // sides are ≅ so it is an isosceles trapezoid

4. $B(-9, 1), E(2, 3), F(12, -2), G(1, -4)$
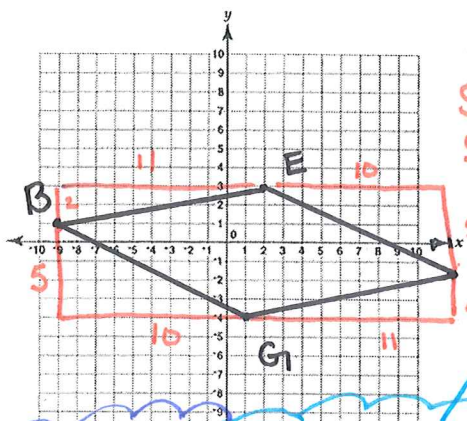
slopes

Slope EF $= -\frac{1}{2}$

Slope FG $= \frac{2}{11}$

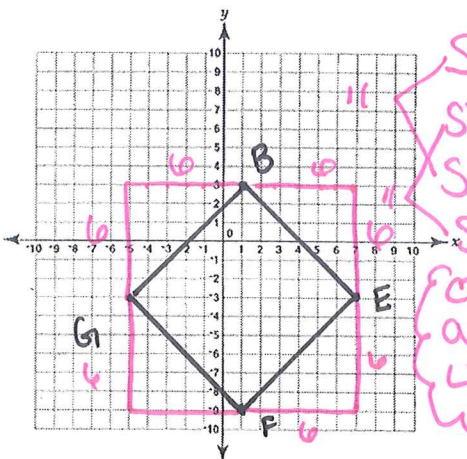Slope BG $= -\frac{1}{2}$

Slope BE $= \frac{2}{11}$

para

distances

$EF^2 = 5^2 + 10^2$

$EF = \sqrt{125}$

$\boxed{EF = 5\sqrt{5}}$

$BE^2 = 2^2 + 11^2$

$BE = \sqrt{125}$

$\boxed{BE = 5\sqrt{5}}$

$BG^2 = 5^2 + 10^2$

$\boxed{BG = 5\sqrt{5}}$

$FG^2 = 2^2 + 11^2$

$\boxed{FG = 5\sqrt{5}}$

EF || BG
FG || BE

Op. sides are Parallel ∴ it is a parallelogram by definition

$EF \cong BG \cong BE \cong FG$ ∴ all 4 sides $\cong$ it is a Rhombus by definition.

5. $B(1, 3), E(7, -3), F(1, -9), G(-5, -3)$

Slope BE $= -1$

Slope EF $= 1$

Slope GF $= -1$

Slope GB $= 1$

consecutive sides are ⊥ and thus 4 right ∠s Rectangle

op sides are parallel ∴ it is a parallelogram BE||GF, EF||BG

$BE^2 = 6^2 + 6^2$

$\boxed{BE = 6\sqrt{2}}$

$\boxed{EF = 6\sqrt{2}}$

$\boxed{GF = 6\sqrt{2}}$

$\boxed{BG = 6\sqrt{2}}$

$BE \cong EF \cong GF \cong BG$

all 4 $\cong$ sides ∴ Rhombus by definition

all consecutive Sides are ⊥ meaning all Right ∠s and $BE \cong EF \cong GF \cong BG$ meaning all $\cong$ sides ∴ BEFG is a Square by definition

6. $B(-4, -5), E(1, -5), F(-2, -1), G(-7, -1)$
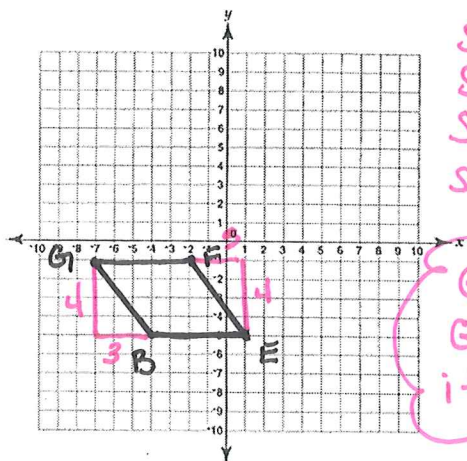
Slope GF $= 0$

Slope BE $= 0$

Slope FE $= -\frac{4}{3}$

Slope GB $= -\frac{4}{3}$

GB || FE and GF || BE ∴ it is a parallelogram

distances

$\boxed{GF = 5}$
$\boxed{BE = 5}$

$GB^2 = 4^2 + 3^2$

$GB = \sqrt{25}$

$\boxed{GB = 5}$

$FE^2 = 3^2 + 4^2$

$\sqrt{FE^2} = \sqrt{25}$

$\boxed{FE = 5}$

$GF \cong GB \cong BE \cong FE$ ∴ it is a Rhombus