Name: Key
CC GEOMETRY

Date: 5/3/18
TROICI

QUIZ 9.2 REVIEW- COORDINATE PROOFS
OPEN NOTES QUIZ ON MONDAY 5/7/18

Parallelogram

- Opposite sides are parallel
- Opposite sides are congruent
- Opposite angles are congruent
- Diagonals bisect each other
- Consecutive angles are supplementary

Rhombus

- All the properties of a parallelogram
- Four sides are equal in length
- Diagonals are perpendicular
- Diagonals bisect each pair of opposite angles

Rectangle

- All the properties of a parallelogram
- Diagonals are congruent
- Contains four right angles

Square

- All the properties of a parallelogram
- Diagonals are congruent and perpendicular
- Is a rectangle with all sides congruent
- Is a rhombus with four right angles

Trapezoid

- At least 1 pair of opposite sides are parallel
- The parallel sides are called bases

Isosceles Trapezoid

- Has all the properties of a trapezoid
- One pair of opposite sides are congruent
- Diagonals are congruent

Kite

- 2 pairs of adjacent congruent sides
- Diagonals are perpendicular

	DISTANCE	SLOPE	MIDPOINT
FORMULA	$d=\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$	$m=\frac{y_2-y_1}{x_2-x_1}$	$mp=\left(\frac{x_1+x_2}{2},\frac{y_1+y_2}{2}\right)$
KEY WORDS	CONGRUENT	parallel (equal) $\perp$ (opposite reciprocal)	BISECT

Quadrilateral MARY has vertices M(-3,0), A(1,1), R,(5-1) and Y(-3,-3).

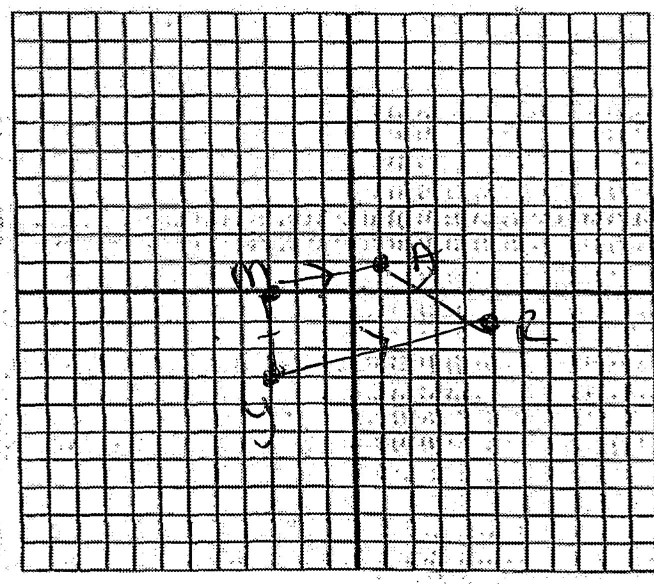
a. Show that MARY is a trapezoid.

b. Show that MARY is *not* an isosceles trapezoid.

Plan:

① prove at least one pair of opp. sides are $\parallel$ (Trap.)

② prove legs are <u>not</u> $\cong$



$m_{\overline{MA}} = \frac{1-0}{1-3} = \frac{1}{4}$ $\qquad \overline{MA} \parallel \overline{YR}$

$m_{\overline{YR}} = \frac{-3-\cancel{+}1}{-3-5} = \frac{-2}{-8} = \frac{1}{4}$

$\therefore$ MARY is a trapezoid b/c at least one pair of opp. sides are $\parallel$.

$d_{\overline{MY}} = \sqrt{(-3--3)^2+(0--3)^2} = \sqrt{9}$ $\qquad \overline{MY} \ncong \overline{AR}$

$d_{\overline{AR}} = \sqrt{(1-5)^2+(1--1)^2} = \sqrt{20}$

$\therefore$ mary is <u>NOT</u> an isosceles trapezoid b/c the legs are not $\cong$.

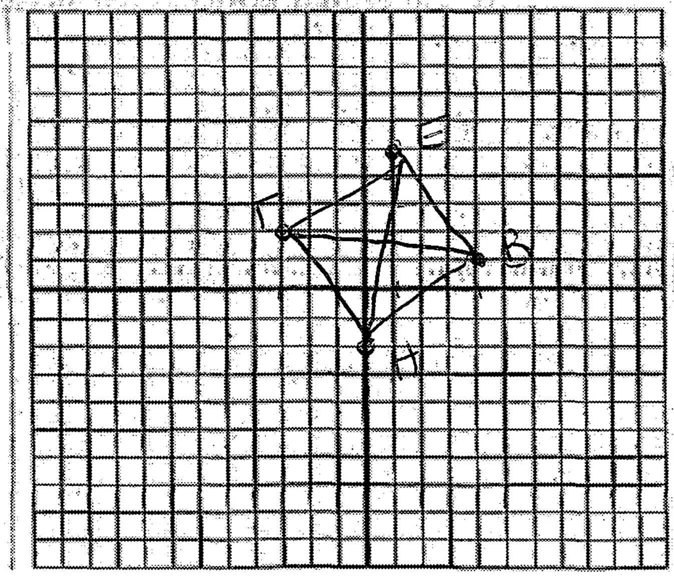
4) The coordinates of the vertices of quadrilateral BETH are B(4,1), E(1,5), T(-3,2), and H(0,-2). Prove the quadrilateral is a <u>square</u>.

Plan:

① prove ▱ (Diagonals bisect)

② prove rectange (Diagonals are ≅)

③ prove Rhombus (Diagonals are ⊥)



$mp_{\overline{BT}}: \left(\frac{4+-3}{2}, \frac{1+2}{2}\right) = (.5, 1.5)$

$mp_{\overline{EH}}: \left(\frac{1+0}{2}, \frac{5+-2}{2}\right) = (.5, 1.5)$

∴ BETH is a ▱ b/c the diagonals bisect

$d_{\overline{BT}}: \sqrt{(4-^-3)^2+(1-2)^2} = \sqrt{50}$ ✓ $\overline{BT} \cong \overline{EH}$

$d_{\overline{EH}}: \sqrt{(1-0)^2+(5-^-2)^2} = \sqrt{50}$

∴ BETH is a rectange b/c the diagonals are ≅

$m_{\overline{BT}}: \frac{2-1}{-3-4} = \frac{1}{-7}$

$m_{\overline{EH}}: \frac{-2-5}{0-1} = \frac{-7}{-1} = 7$

$\overline{BT} \perp \overline{EH}$

∴ BETH is a rhombus b/c the diagonals are ⊥

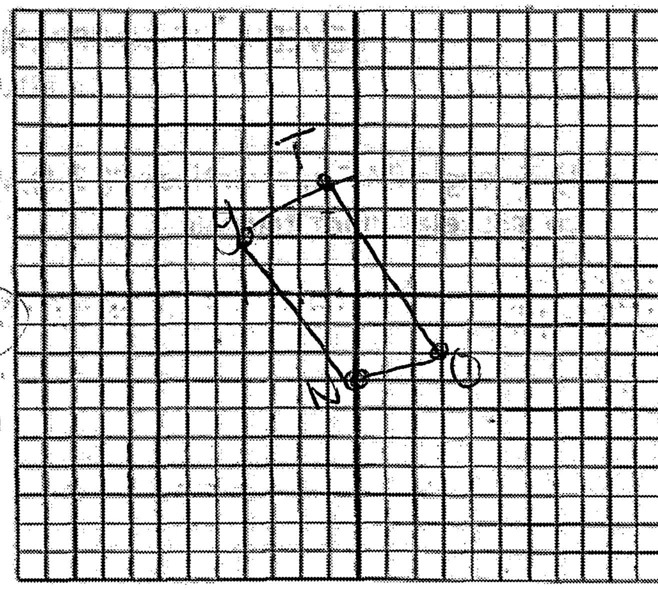
∴ BETH is a square b/c it has the properties of a ▱, rectangle and rhombus

2) The points T(-1,4), O(3,-2), N(0,-4) and Y(-4,2) form a quadrilateral. Prove TONY is a rectangle.

Plan:

① prove ▱ (Diagonals bisect)

② prove diagonals are ≅



$mp_{\overline{NT}} = \left(\frac{-1+0}{2}, \frac{4+-4}{2}\right) = (-.5, 0)$

$mp_{\overline{OY}} = \left(\frac{3+-4}{2}, \frac{-2+2}{2}\right) = (-.5, 0)$

∴ TONY is a ▱ b/c the diagonals bisect.

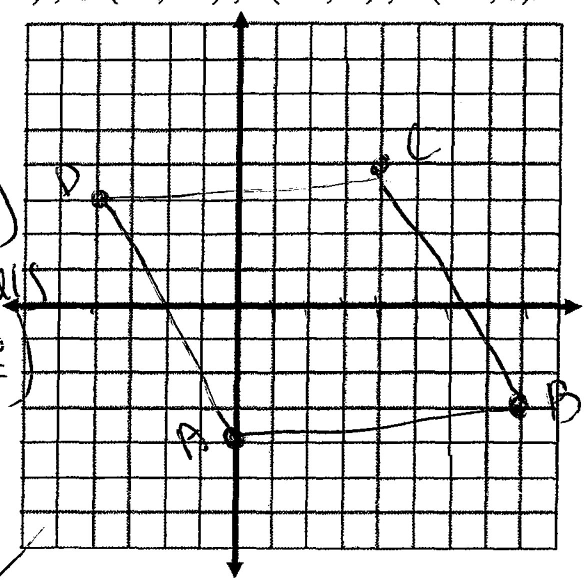
$d_{\overline{NT}} : \sqrt{(0-1)^2 + (-4-4)^2} = \sqrt{65}$

$d_{\overline{OY}} : \sqrt{(-4-3)^2 + (2 - -2)^2} = \sqrt{65}$

$\overline{NT} \cong \overline{OY}$

∴ TONY is a rectangle b/c the diagonals are ≅

3.) The coordinates of the vertices of quadrilateral *ABCD* are $A(0, -4)$, $B(8, -3)$, $C(4, 4)$, $D(-4, 3)$. Prove that quadrilateral *ABCD* is a rhombus, but not a rectangle.



plan:

① prove ▱ (Diagonals bisect)

② prove rhombus (Diagonals ⊥)

③ prove NOT rectangle (Diagonals are not ≅)

$mp_{\overline{AC}}: \left(\frac{0+4}{2}, \frac{-4+4}{2}\right) = (2, 0)$

$mp_{\overline{BD}}: \left(\frac{8+-4}{2}, \frac{-3+3}{2}\right) = (2, 0)$

∴ ABCD is a ▱ b/c the diagonals bisect

$m_{\overline{AC}}: \frac{4--4}{4-0} = \frac{8}{4} = 2$

$m_{\overline{BD}}: \frac{3--3}{-4-8} = \frac{6}{-12} = -\frac{1}{2}$

$\overline{AC} \perp \overline{BD}$

∴ ABCD is a rhombus b/c the diagonals are ⊥

$d_{\overline{AC}}: \sqrt{(0-4)^2+(-4-4)^2} = \sqrt{80}$

$d_{\overline{BD}}: \sqrt{(8--4)^2+(-3-3)^2} = \sqrt{180}$

$\overline{AC} \not\cong \overline{BD}$

∴ ABCD is NOT a rectangle b/c the diagonals are not ≅.