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Date _____
Geometry

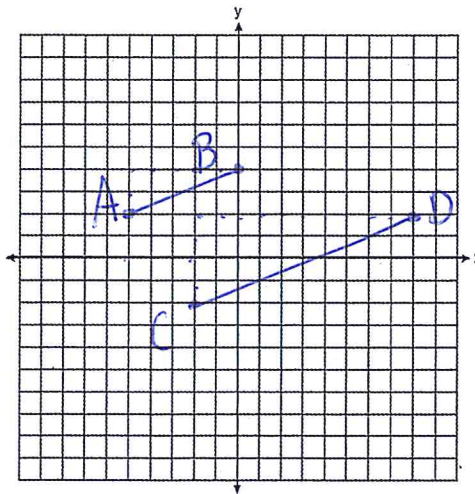
Parallel lines have the same slope
Perpendicular lines have negative reciprocal slopes

Proving Segments are Parallel/Perpendicular

1. A(-5,2) B(0,4) C(-2,-2) D(8,2)

Prove $\overline{AB} \parallel \overline{CD}$

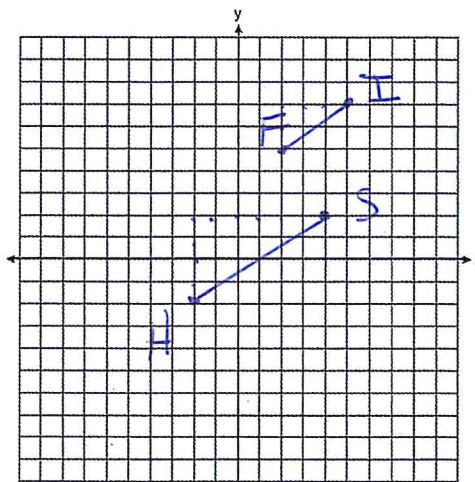
$\overline{AB} \parallel \overline{CD}$ because they have the same slope
 $m_{\overline{AB}} = \frac{2}{5}$
 $m_{\overline{CD}} = \frac{4}{10} = \frac{2}{5}$



2. F(2,5) I(5,7) S(4,2) H(-2,-2).

Prove $\overline{FI} \parallel \overline{SH}$

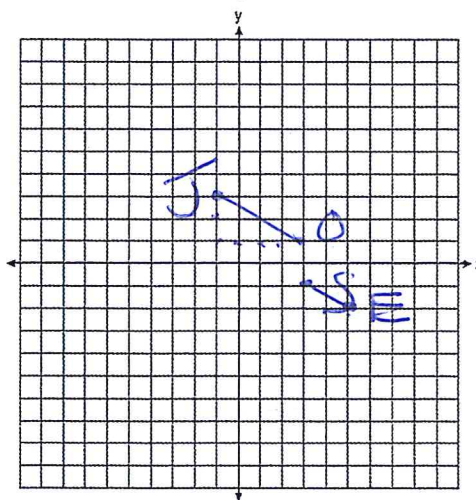
$\overline{FI} \parallel \overline{SH}$ because they have the same slope
 $m_{\overline{FI}} = \frac{2}{3}$
 $m_{\overline{SH}} = \frac{4}{6} = \frac{2}{3}$



3. J(-1,3) O(3,1) S(3,-1) and E(5,-2).

Prove $\overline{JO} \parallel \overline{ES}$

$\overline{JO} \parallel \overline{ES}$ because they have the same slope
 $m_{\overline{JO}} = \frac{-2}{4} = -\frac{1}{2}$
 $m_{\overline{ES}} = \frac{-1}{2} = -\frac{1}{2}$



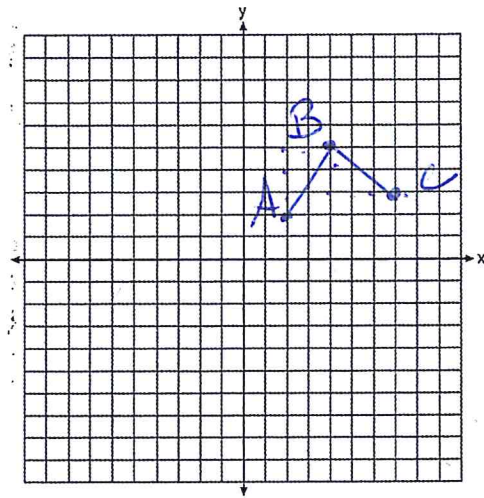
4. A(2,2) B(4,5) C(7,3)

Prove that $\overline{AB} \perp \overline{BC}$

$\overline{AB} \perp \overline{BC}$ because they have negative reciprocal slopes.

$$m_{\overline{AB}} = \frac{3}{2}$$

$$m_{\overline{BC}} = -\frac{2}{3}$$



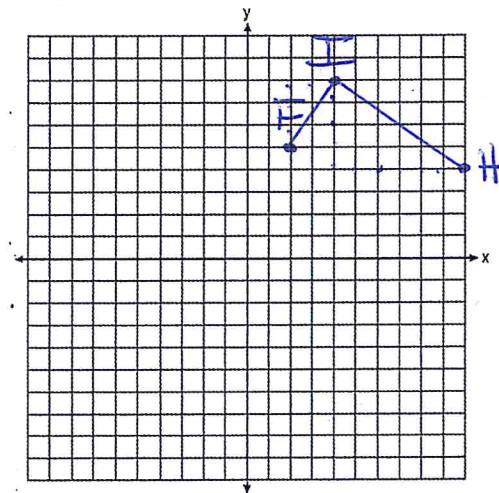
5. F(2,5) I(4,8), H(10,4).

Prove $\overline{FI} \perp \overline{IH}$

$\overline{FI} \perp \overline{IH}$ because they have negative reciprocal slopes.

$$m_{\overline{FI}} = \frac{3}{2}$$

$$m_{\overline{IH}} = -\frac{4}{6} = -\frac{2}{3}$$



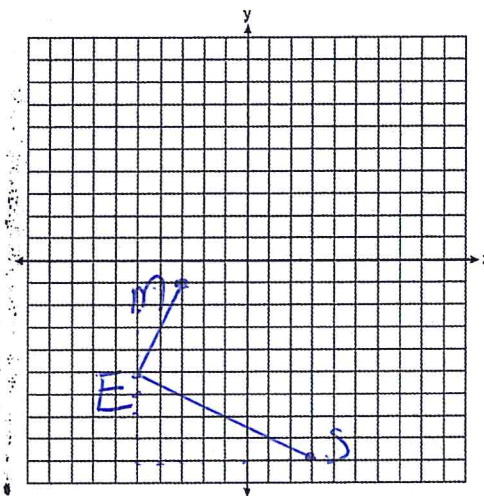
6. M(-3,-1), E(-5,-5), S(3,-9).

Prove $\overline{ME} \perp \overline{ES}$

$\overline{ME} \perp \overline{ES}$ because they have negative reciprocal slopes.

$$m_{\overline{ME}} = \frac{4}{2} = \frac{2}{1}$$

$$m_{\overline{ES}} = -\frac{4}{8} = -\frac{1}{2}$$



7. T(-8,8) A(8,-4) C(0,3) and O(-8,9).

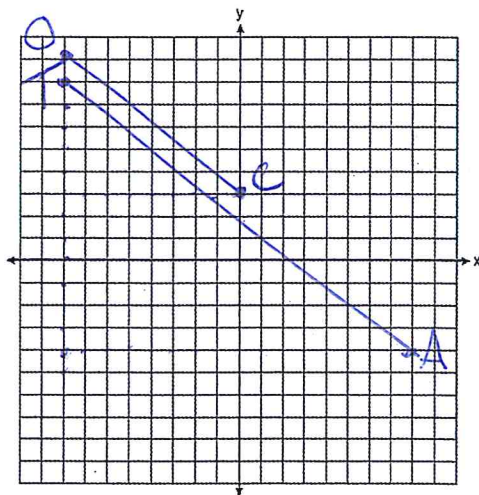
Prove $\overline{AC} \parallel \overline{TO}$

$\overline{TA} \parallel \overline{CO}$

$\overline{TA} \parallel \overline{CO}$ because they have the same slope

$$m\overline{TA} = \frac{-12}{16} = -\frac{3}{4}$$

$$m\overline{CO} = \frac{-6}{8} = -\frac{3}{4}$$



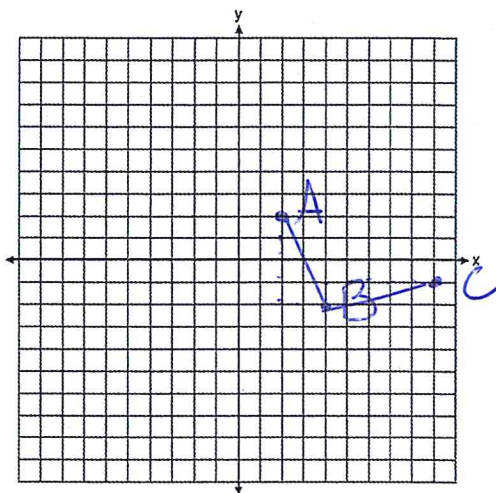
8. A(2,2), B(4,-2), C(9,1).

Prove \overline{AB} not $\perp \overline{BC}$

$\overline{AB} \not\perp \overline{BC}$ because they don't have negative reciprocal slopes.

$$m\overline{AB} = \frac{-4}{2} = -2$$

$$m\overline{BC} = \frac{1}{3}$$



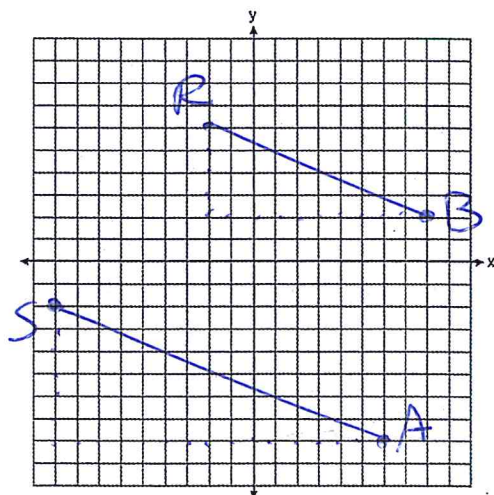
9. S(-9,-2), A(6,-8), B(8,2), R(-2,6)

Prove $\overline{SA} \parallel \overline{BR}$

$\overline{SA} \parallel \overline{BR}$ because they have the same slope.

$$m\overline{SA} = \frac{-6}{15} = -\frac{2}{5}$$

$$m\overline{BR} = \frac{-4}{10} = -\frac{2}{5}$$



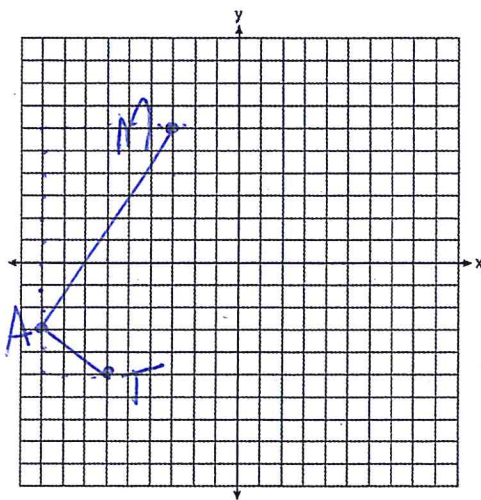
10. $M(-3,6)$, $A(-9,-3)$, $T(-6,-5)$.

Prove $\overline{MA} \perp \overline{AT}$

$\overline{MA} \perp \overline{AT}$ because they have negative reciprocal slopes

$$m_{\overline{MA}} = \frac{9}{6} = \frac{3}{2}$$

$$m_{\overline{AT}} = -\frac{2}{3}$$



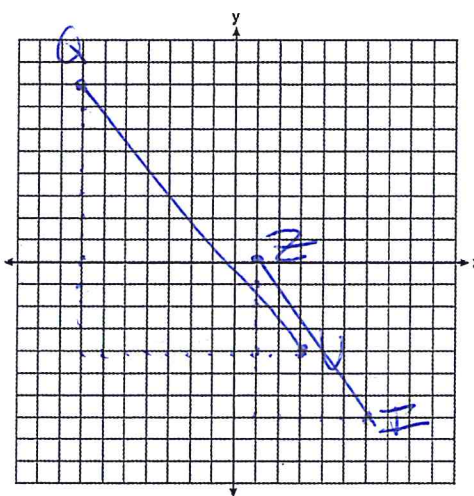
11. $Q(-7,8)$, $U(3,-4)$, $I(6,-7)$, $Z(1,0)$

Prove \overline{QU} not $\parallel \overline{IZ}$

$\overline{QU} \not\parallel \overline{IZ}$ because they don't have the same slope.

$$m_{\overline{QU}} = -\frac{12}{10} = -\frac{6}{5}$$

$$m_{\overline{IZ}} = -\frac{7}{5}$$



12. $J(-3,2)$, $A(-5,-4)$, $C(6,-7)$, $L(7,-4)$

Prove $\overline{JA} \parallel \overline{CL}$

$\overline{JA} \parallel \overline{CL}$ because they have the same slope

$$m_{\overline{JA}} = \frac{6}{2} = 3$$

$$m_{\overline{CL}} = \frac{3}{1} = 3$$

