6.7

Name (print first and last) _____ **Per**_____ **Date:** 2/14 due 2/24

6.7 Polygons: Parallel & Perpendicular Lines **Geometry Regents 2013-2014 Ms. Lomac**

SLO: I can prove polygon qualities using a coordinate grid.

(1) ☐ You will be asked to prove that a set of 3 or 4 points can be connected to form one of the shapes below. To do this, you must know **WHAT** defines them. Review each of these shapes and be able to state what defines them.

Isosceles Triangle Right Triangle Equilateral Triangle Parallelogram Rhombus Rectangle
Square Kite Trapezoid Isosceles Trapezoid

(2) ☐ Below are qualities you may need to prove. What **EVIDENCE** would you have to show on a coordinate grid to prove they exist?

PARALLEL

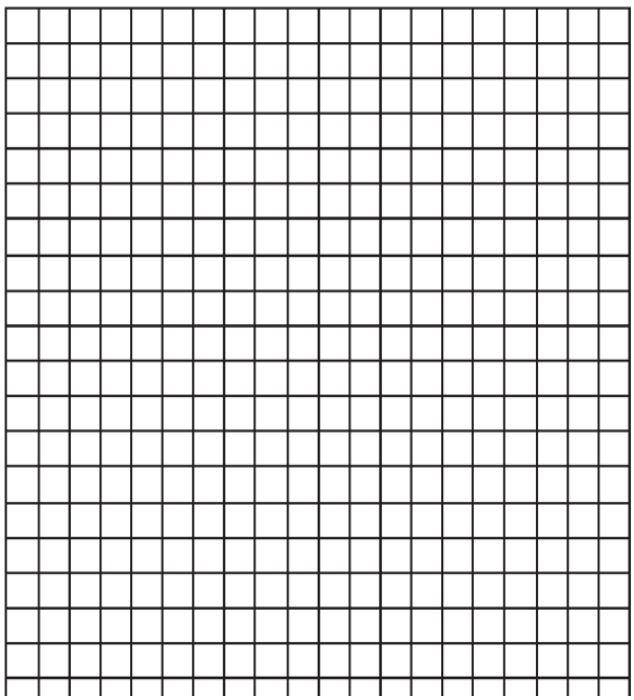
PERPENDICULAR (right angles)

CONGRUENT SEGMENTS (equal length)

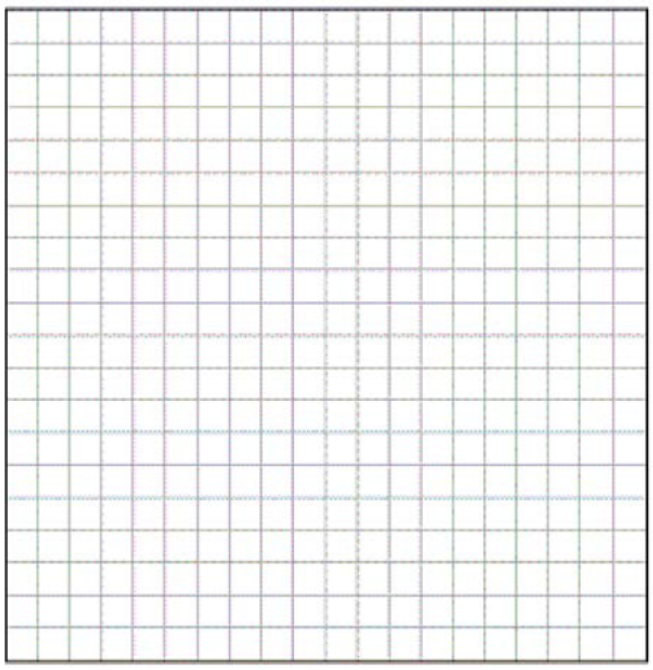
BISECT (equal lengths)

(3) ☐ Prove. Know **WHAT** you will prove. Know what **EVIDENCE** you will need. **COMMUNICATE** your evidence.

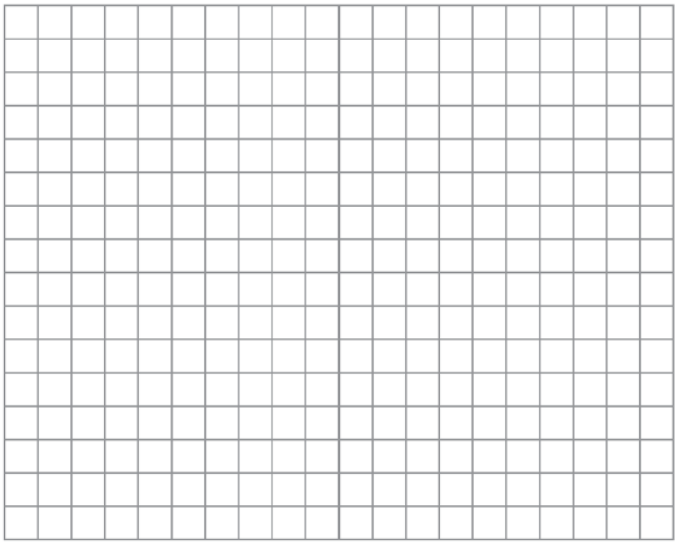
☐ (a) Quadrilateral $KATE$ has vertices $K(1,5)$, $A(4,7)$, $T(7,3)$, and $E(1,-1)$.
a Prove that $KATE$ is a trapezoid. [The use of the grid is optional.]
b Prove that $KATE$ is *not* an isosceles trapezoid.



6.7 ☐ (b) Triangle ABC has coordinates $A(-6,2)$, $B(-3,6)$, and $C(5,0)$. Find the perimeter of the triangle. Express your answer in simplest radical form. [The use of the grid below is optional.]



☐ (c) Given: Quadrilateral $ABCD$ has vertices $A(-5,6)$, $B(6,6)$, $C(8,-3)$, and $D(-3,-3)$.
Prove: Quadrilateral $ABCD$ is a parallelogram but is neither a rhombus nor a rectangle. [The use of the grid below is optional.]



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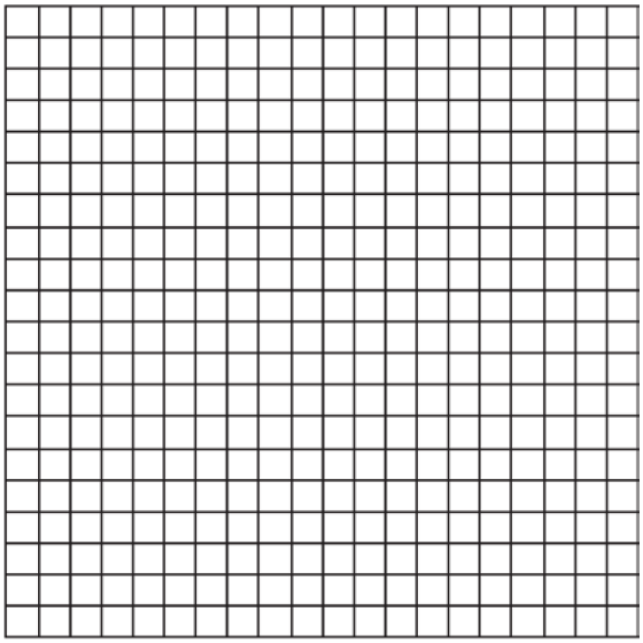
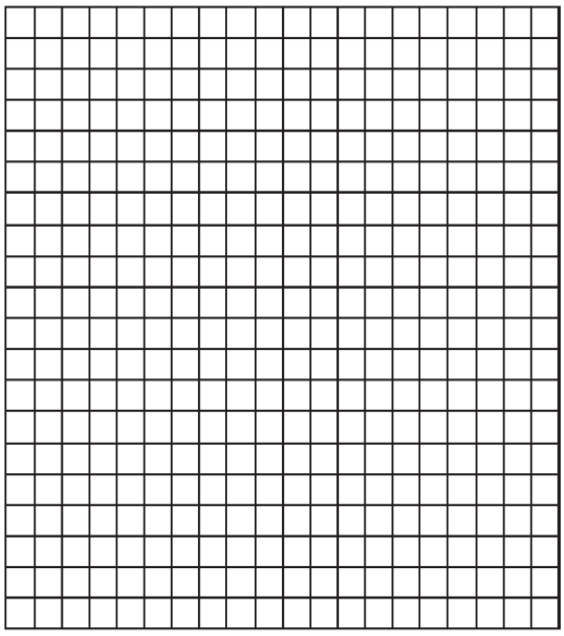
☐ (d) Given: $J(-4, 1), E(-2, -3), N(2, -1)$
Prove: ΔJEN is an isosceles right triangle.
[The use of the grid is optional.]



☐ (e) Jim is experimenting with a new drawing program on his computer. He created quadrilateral $TEAM$ with coordinates $T(-2,3)$, $E(-5,-4)$, $A(2,-1)$, and $M(5,6)$. Jim believes that he has created a rhombus but not a square. Prove that Jim is correct. [The use of the grid is optional.]



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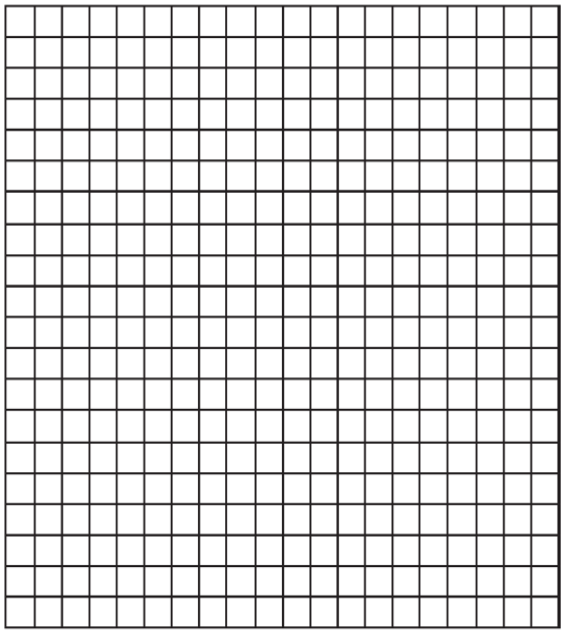
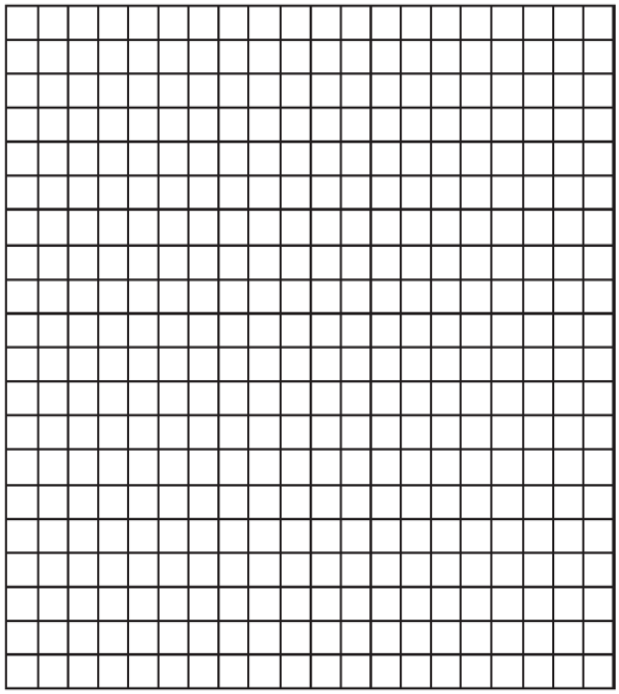
☐ (f) Jim is experimenting with a new drawing program on his computer. He created quadrilateral *TEAM* with coordinates $T(-2,3)$, $E(-5,-4)$, $A(2,-1)$, and $M(5,6)$. Jim believes that he has created a rhombus but not a square. Prove that Jim is correct. [The use of the grid is optional.]



☐ (g) Given: $A(-2,2)$, $B(6,5)$, $C(4,0)$, $D(-4,-3)$
Prove: *ABCD* is a parallelogram but not a rectangle. [The use of the grid is optional.]



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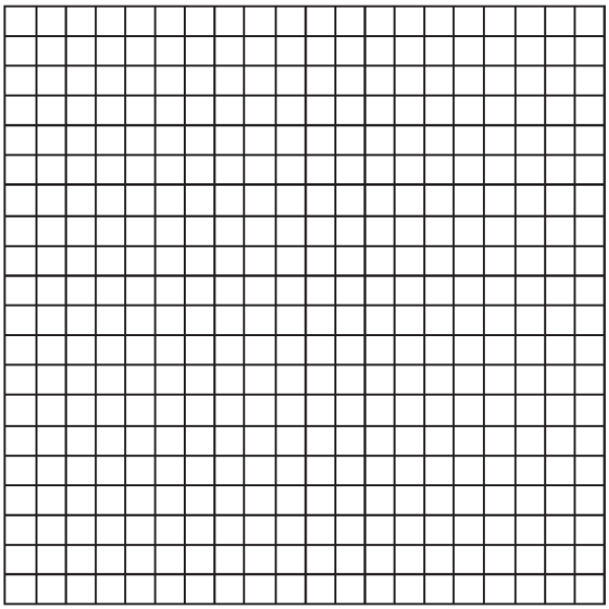
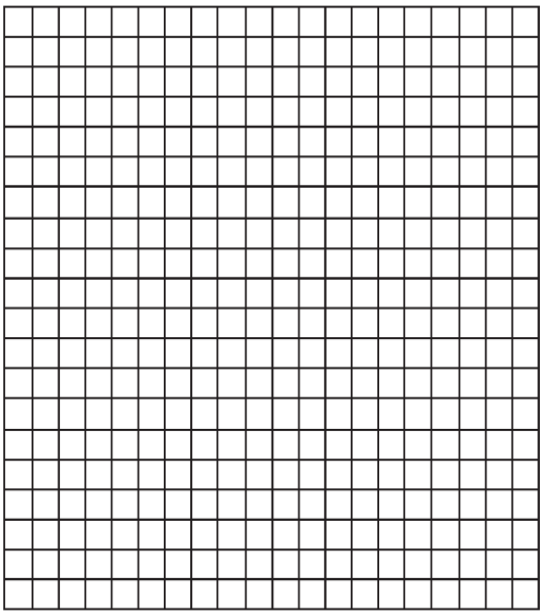
☐ (h) Quadrilateral $MATH$ has coordinates $M(1,1)$, $A(-2,5)$, $T(3,5)$, and $H(6,1)$. Prove that quadrilateral $MATH$ is a rhombus and prove that it is *not* a square. [The use of the grid is optional.]



☐ (i) Quadrilateral $ABCD$ has vertices $A(2,3)$, $B(7,10)$, $C(9,4)$, and $D(4,-3)$. Prove that $ABCD$ is a parallelogram but *not* a rhombus. [The use of the grid is optional.]



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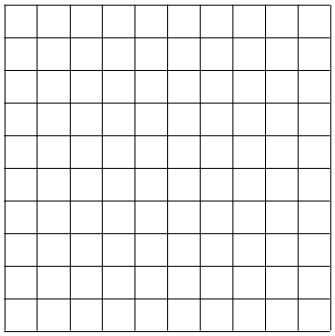
(4) ☐ Answer each multiple choice question.

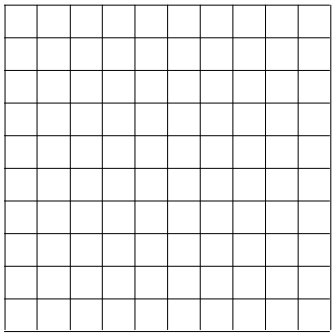
☐ (a) Triangle ABC has vertices $A(0,0)$, $B(3,2)$, and $C(0,4)$. The triangle may be classified as

1) equilateral
2) isosceles
3) right
4) scalene



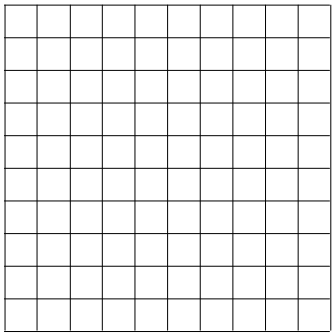
☐ (b) The vertices of ΔABC are $A(-1,-2)$, $B(-1,2)$ and $C(6,0)$. Which conclusion can be made about the angles of ΔABC?

1) $m\angle A = m\angle B$
2) $m\angle A = m\angle C$
3) $m\angle ACB = 90$
4) $m\angle ABC = 60$



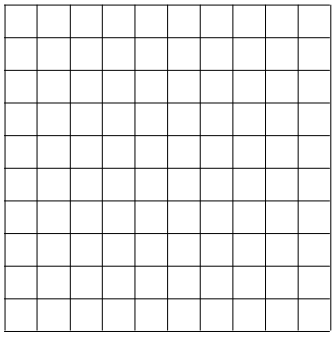
☐ (c) The coordinates of the vertices of parallelogram $ABCD$ are $A(-3,2)$, $B(-2,-1)$, $C(4,1)$, and $D(3,4)$. The slopes of which line segments could be calculated to show that $ABCD$ is a rectangle?

1) $\overline{AB}$ and $\overline{DC}$
2) $\overline{AB}$ and $\overline{BC}$
3) $\overline{AD}$ and $\overline{BC}$
4) $\overline{AC}$ and $\overline{BD}$



☐ (d) Which type of triangle can be drawn using the points $(-2,3)$, $(-2,-7)$, and $(4,-5)$?

1) scalene
2) isosceles
3) equilateral
4) no triangle can be drawn



☐ (e) Parallelogram $ABCD$ has coordinates $A(1,5)$, $B(6,3)$, $C(3,-1)$, and $D(-2,1)$. What are the coordinates of E, the intersection of diagonals $\overline{AC}$ and $\overline{BD}$?

1) $(2,2)$
2) $(4.5,1)$
3) $(3.5,2)$
4) $(-1,3)$