

Name: _____

Date: _____

UNIT 7

LESSON 10

AIM: HOW DO PROVE RHOMBI AND SQUARES USING COORDINATE GEOMETRY?

Do now: The diagonals of rhombus $TEAM$ intersect at $P(2, 1)$. If the equation of the line that contains diagonal \overline{TA} is $y = -x + 3$, what is the equation of a line that contains diagonal EM ?

- 1) $y = x - 1$
- 2) $y = x - 3$
- 3) $y = -x - 1$
- 4) $y = -x - 3$

NOTES:

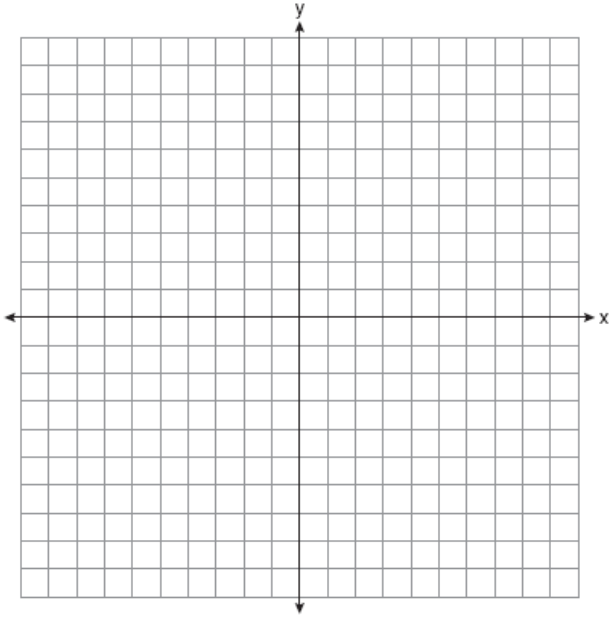
- A rhombus is a parallelogram with _____ sides, and _____ diagonals.
- A square is a parallelogram with _____ sides, _____ diagonals and _____ angles.

1) Parallelogram $ABCD$ has coordinates $A(0, 7)$ and $C(2, 1)$. Which statement would prove that $ABCD$ is a rhombus?

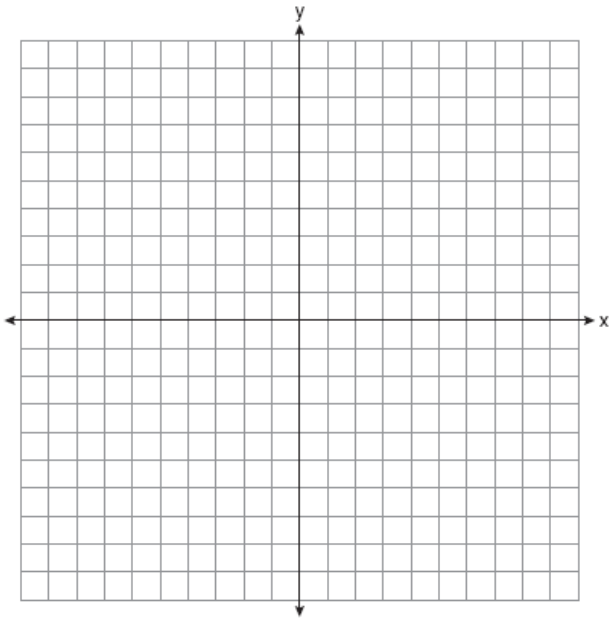
- 1) The midpoint of \overline{AC} is $(1, 4)$.
- 2) The length of \overline{BD} is $\sqrt{40}$.
- 3) The slope of \overline{BD} is $\frac{1}{3}$.
- 4) The slope of \overline{AB} is $\frac{1}{3}$.

2) The coordinates of two vertices of square $ABCD$ are $A(2, 1)$ and $B(4, 4)$. Determine the slope of side \overline{BC} .

3) In square $GEOM$, the coordinates of G are $(2, -2)$ and the coordinates of O are $(-4, 2)$. Determine and state the coordinates of vertices E and M . [The use of the set of axes below is optional.]

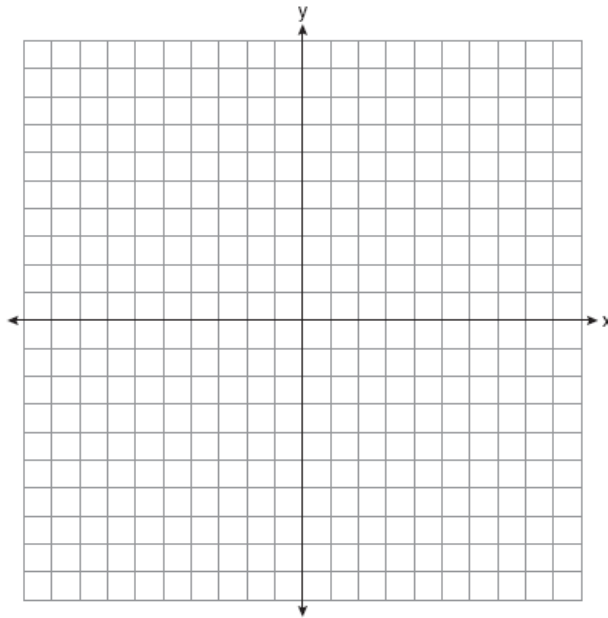


4) Quadrilateral $NATS$ has coordinates $N(-4, -3)$, $A(1, 2)$, $T(8, 1)$, and $S(3, -4)$. Prove quadrilateral $NATS$ is a rhombus. [The use of the set of axes below is optional.]



CONCLUSION: _____

5) The coordinates of the vertices of $\triangle ABC$ are $A(1, 2)$, $B(-5, 3)$, and $C(-6, -3)$. Prove that $\triangle ABC$ is isosceles. State the coordinates of point D such that quadrilateral $ABCD$ is a square. Prove that your quadrilateral $ABCD$ is a square. [The use of the set of axes below is optional.]



CONCLUSION: _____

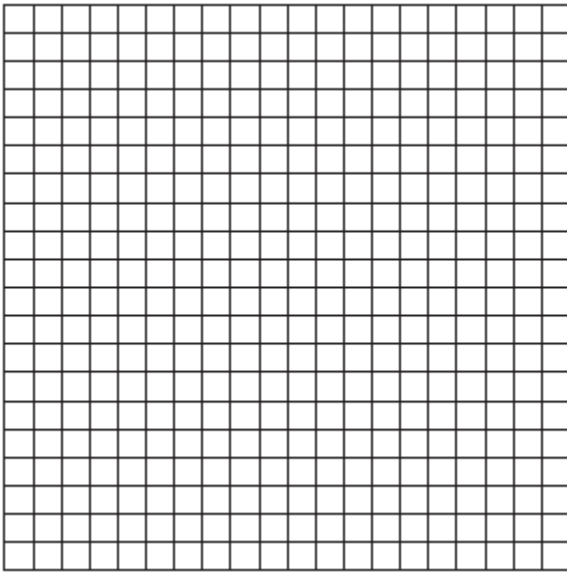
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UNIT 7

LESSON 10 HOMEWORK

1) The coordinates of quadrilateral $ABCD$ are $A(-1, -5)$, $B(8, 2)$, $C(11, 13)$, and $D(2, 6)$. Using coordinate geometry, prove that quadrilateral $ABCD$ is a **rhombus**. [The use of the grid is optional.]

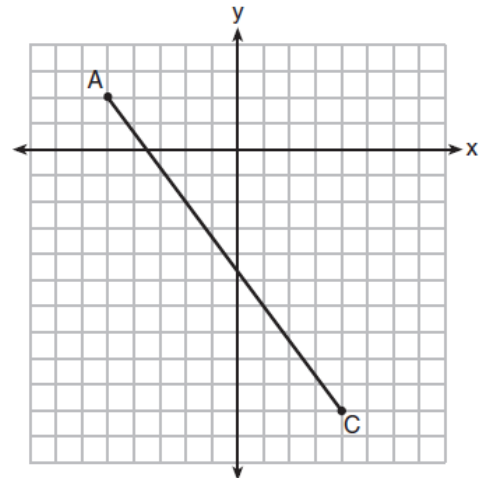


CONCLUSION: _____

2) In the diagram below, \overline{AC} has endpoints with coordinates $A(-5, 2)$ and $C(4, -10)$.

If B is a point on \overline{AC} and $AB:BC = 1:2$, what are the coordinates of B ?

- 1) $(-2, -2)$ 2) $\left(-\frac{1}{2}, -4\right)$ 3) $\left(0, -\frac{14}{3}\right)$ 4) $(1, -6)$



3) Which equation represents the perpendicular bisector of \overline{AB} whose endpoints are $A(8, 2)$ and $B(0, 6)$? (*HINT: 3 steps!*)

- 1) $y = 2x - 4$
2) $y = -\frac{1}{2}x + 2$
3) $y = -\frac{1}{2}x + 6$
4) $y = 2x - 12$