Name:

Common Core Geometry

Unit 9

Coordinate Geometry

Mr. Schlansky

2025

Lesson 1: I can calculate distance using $\sqrt{\Delta x^2 + \Delta y^2}$

Distance formula: $d = \sqrt{\Delta x^2 + \Delta y^2}$

Count on the graph to find $\Delta x \ and \ \Delta y$.

Lesson 2: I can calculate slope using $\frac{\Delta y}{\Delta x}$

Slope formula: $m = \frac{\Delta y}{\Delta x}$

Count on the graph to find $\Delta x \ and \ \Delta y$.

Lesson 3: I can calculate midpoint using $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

Midpoint formula: $MP = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$.

If given the midpoint, use the graph to find the other endpoint.

Lesson 4: I can practice calculating slope, distance, and midpoint using their formulas.

Same notes as Lessons 1-3

Lesson 5: I can partition a line segment using $\frac{\Delta x}{p}$ *and* $\frac{\Delta y}{p}$ and counting on the graph

Partitions (Directed Line Segment):

1) Find $\frac{\Delta x}{p}$ *and* $\frac{\Delta y}{p}$ where p is the number of partitions.

2) Count those values out on the graph between the two endpoints

3) Circle and state the point that matches the given ratio. BE CAREFUL WHICH POINT YOU START FROM!

Use scrap graph paper if not given a graph!

Lesson 6: I can write the equation of a perpendicular bisector by finding the slope, midpoint and using $y - y_1 = m(x - x_1)$.

To write the equation of a perpendicular bisector

1) Calculate midpoint using $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$
2) Calculate slope using $\frac{\Delta y}{\Delta x}$.
3) Find the perpendicular slope by taking the negative reciprocal of the original slope
4) Substitute perpendicular slope and midpoint into $y - y_1 = m(x - x_1)$.

Lesson 7: I can prove segments are congruent by calculating their distance using $d = \sqrt{\Delta x^2 + \Delta y^2}$.

Congruent segments have the same distance!

To prove segments are congruent, calculate their distances to show that they are the same.
To prove segments are not congruent, calculate their distances to show that they are not the same.

Lesson 8: I can prove segments are parallel and perpendicular by calculating their slope using $m = \frac{\Delta y}{\Delta x}$.

Parallel lines have the same slope!

To prove segments are parallel, calculate their slopes to show that they are the same.
To prove segments are not parallel, calculate their slopes to show that they are not the same.

Perpendicular lines have negative reciprocal slopes!

To prove segments are perpendicular, calculate their slopes to show that they are negative reciprocals of each other.
To prove segments are not perpendicular, calculate their slopes to show that they are not negative reciprocals of each other.

Lessons 9 - 11: I can prove shapes using by coordinate geometry by stating their definition, calculating distance (slope for trapezoid), and tying it all together.

How do you prove…?

…an **isosceles triangle**? (2 Distances)
Two Congruent Sides

…an **equilateral triangle?** (3 Distances)
Three Congruent Sides

. … a **right triangle**? (3 Distances)
Show the sides fit into Pythagorean Theorem

… a **parallelogram**? (4 Distances)
Two Pairs of Opposite Sides Congruent

… a **rhombus**? (4 Distances)
All Sides Congruent

… a **rectangle**? (6 Distances)
1) Two Pairs of Opposite Sides Congruent
2) Diagonals Congruent

… a **square**? (6 Distances)
1) All Sides Congruent
2) Diagonals Congruent

…a **trapezoid**? (2 Slopes)
1 pair of opposite sides parallel

…an **isosceles trapezoid**? (2 Slopes, 2 Distances)
1) 1 pair of opposite sides parallel
2) Congruent Legs

Lesson 12: I can prove a figure is not a specific shape by proving it does not have the appropriate property.
To prove something is *not* a shape, prove it does *not* have the necessary property.
To prove a triangle is *not* isosceles, prove it does *not* have two congruent sides
To prove a shape is *not* a rectangle/square, prove it does *not* have congruent diagonals
To prove a shape is *not* a rhombus/square, prove it does *not* have all sides congruent.

Lesson 13: I can master coordinate geometry proofs by practicing!
Same notes as lessons 9 – 12.

Lesson 14: I can create parallelograms by counting the opposite sides on the graph.
To find the fourth point of a parallelogram, count the opposite side on the graph.

Lesson 15: I can complete coordinate geometry proofs incorporating midpoint and creating parallelograms by calculating distance.
Midpoint = $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$
Same notes as lessons 9 – 14.

Lesson 16: I can reduce radicals by finding the largest perfect square that divides in and taking the square root of it.

-Separate into two radicals (perfect squares and non perfect squares). Find the largest perfect square that divides in
-Take the square root of the perfect square. Bring the non-perfect square down

Lesson 17: I can add radicals by reducing first, combining like terms but not combining unlike terms.
Reduce first so they have the same radicand
Add coefficients, keep radicand
*Don't combine unlike terms! To add radicals, they must have the same radicand. You can't combine an integer with a radical!

Lesson 18: I can find the perimeter of a shape by using distance to find the lengths of the sides and adding them together.

1) Find the length of each side using $d = \sqrt{\Delta x^2 + \Delta y^2}$.
2) Add all of the sides together.

If it is a regular polygon, multiply one side by the number of sides.

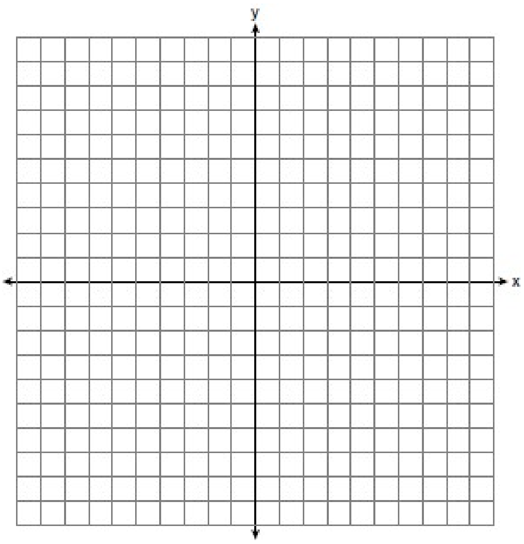
Lesson 19: I can prepare for my coordinate geometry test by practicing!

Name ______________ Date ____________
Mr. Schlansky Geometry

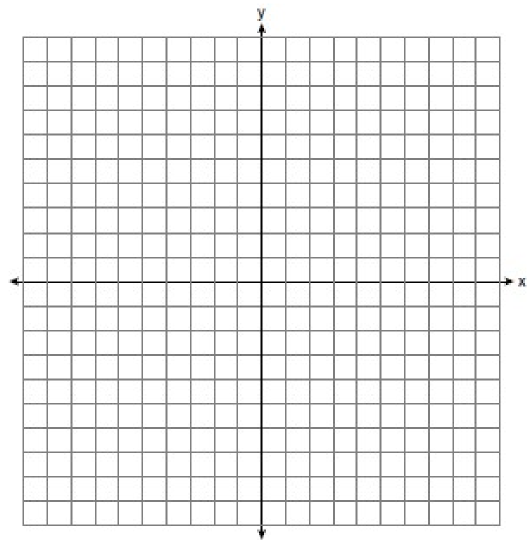
Calculating Distance

Calculate the distance between the following sets of points. Express in simplest radical form

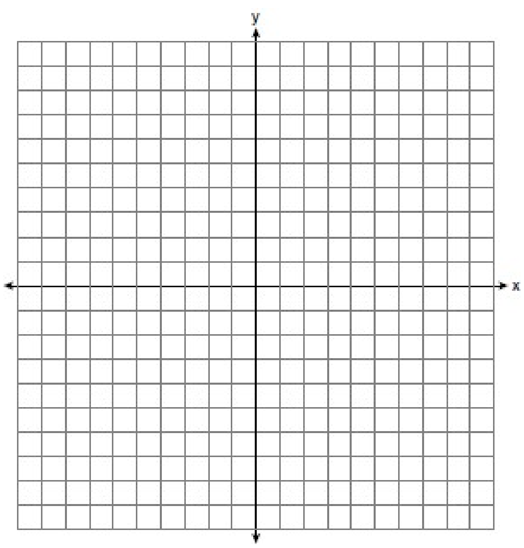
1. (5,1) and (2,5)



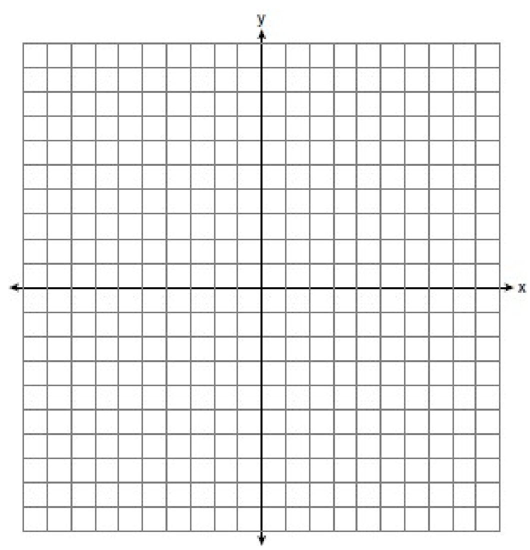
2. (9,1) and (1,-5)



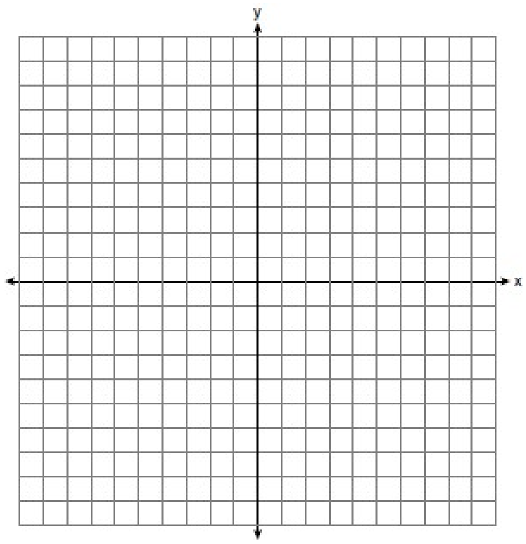
3. (2,5) and (-1,8)



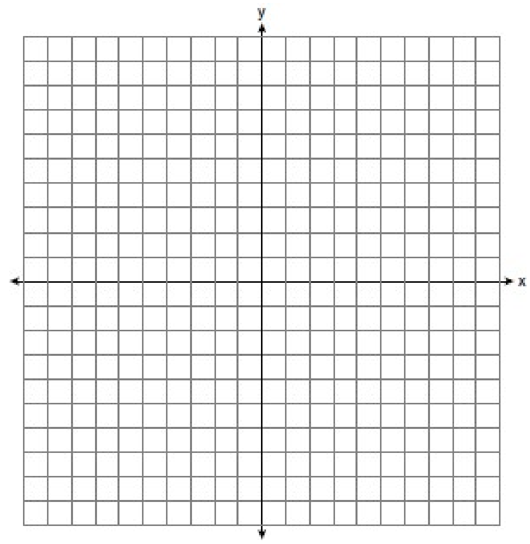
4. (3,1) and (9,0)



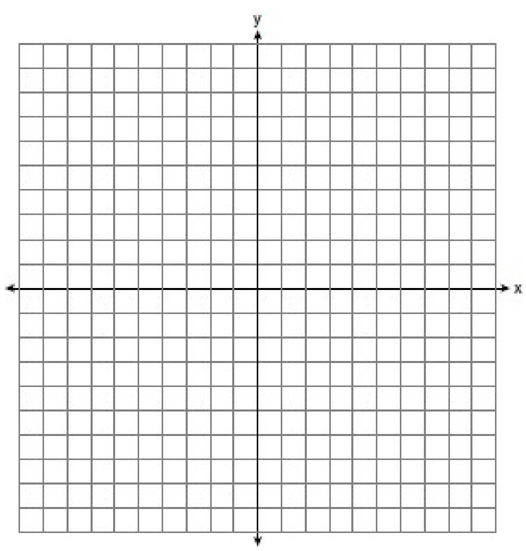
5. (-4,1) and (-1, 1)



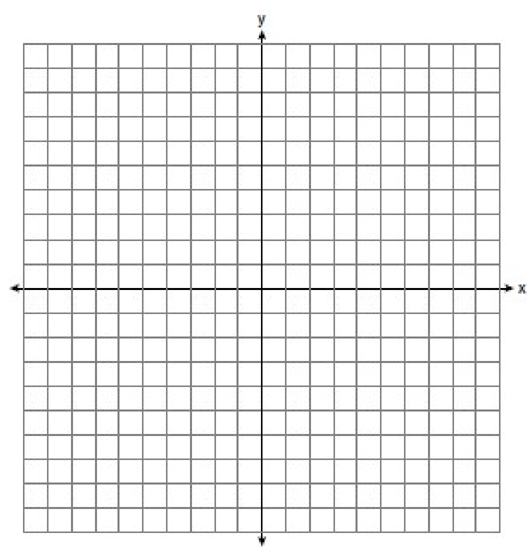
6. (10,-1) and (2, 4)



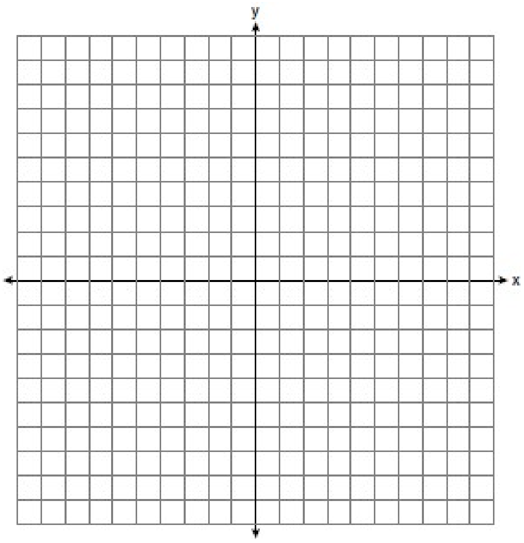
7. (-2,7) and (3, 4)



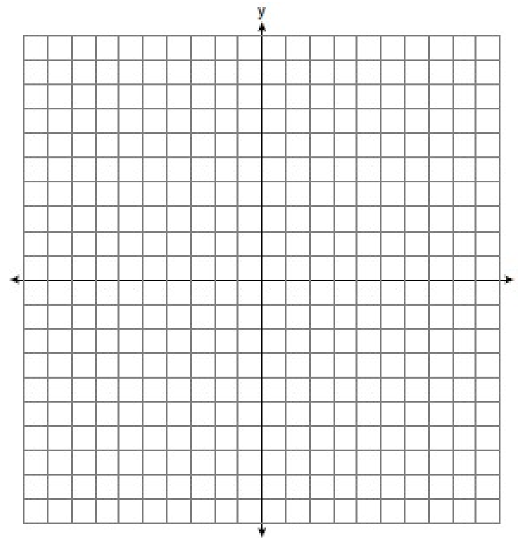
8. (9,0) and (-1, 5)



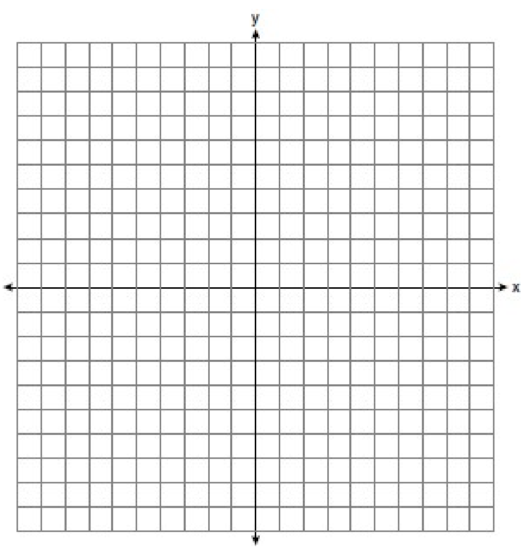
9. (-6,-3) and (-2, 1)



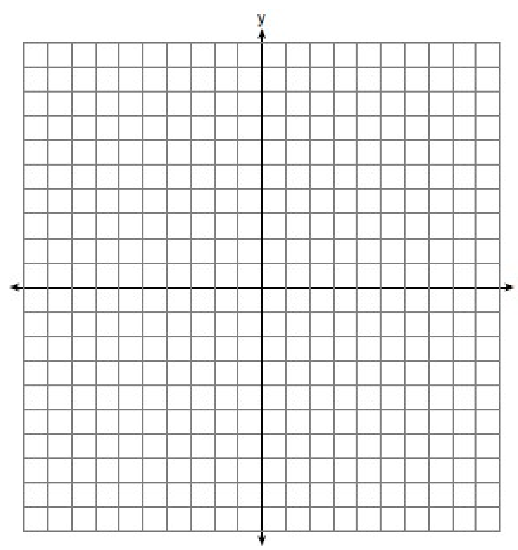
10. (9,-2) and (-4, 8)



11. (-4,7) and (-4, 6)



12. (-13,6) and (47, 2)

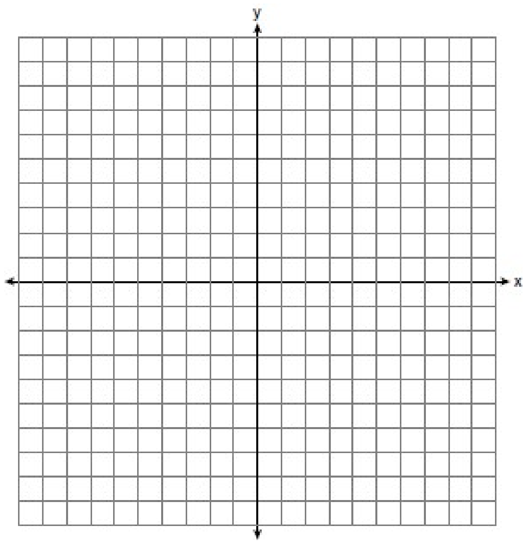


Name ______________ Date ____________
Mr. Schlansky Geometry

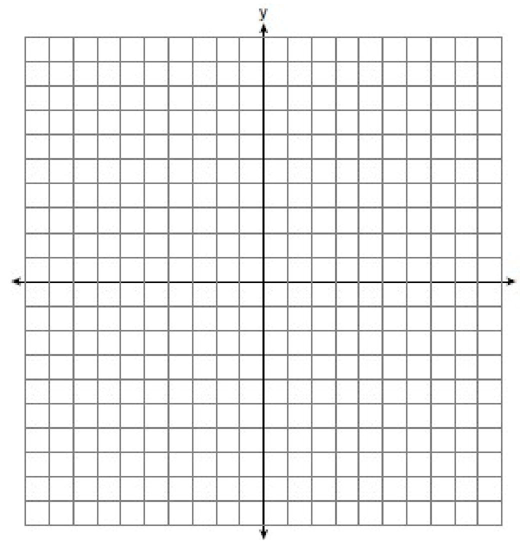
Calculating Slope

Calculate the slopes between the following sets of points. Express in simplest terms

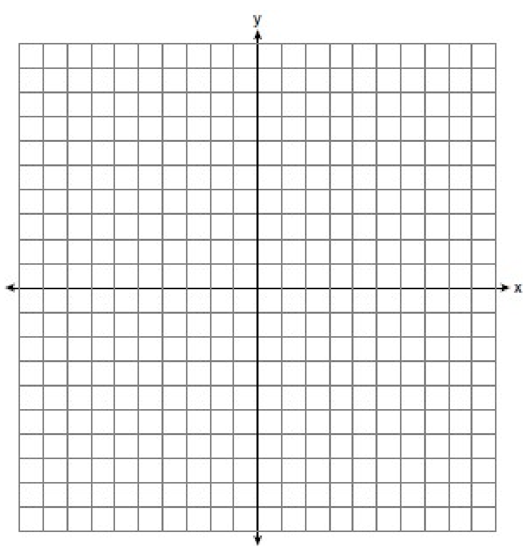
1. (5,1) and (2,5)



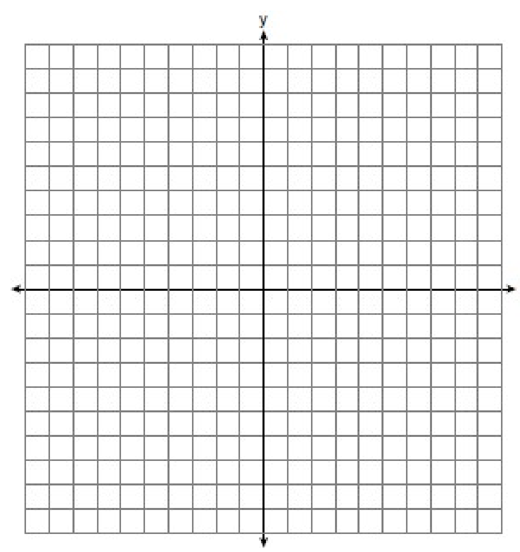
2. (9,1) and (1,-5)



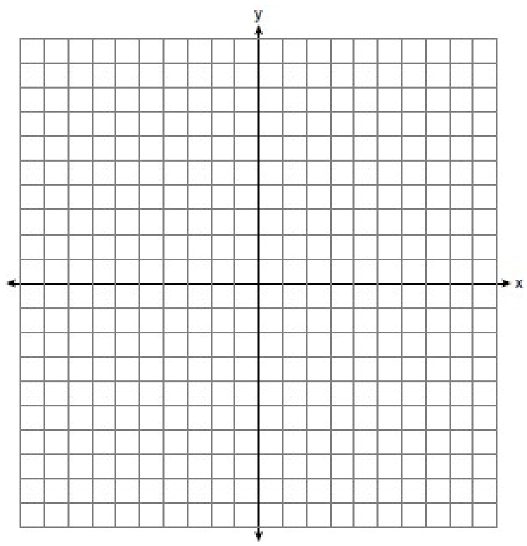
3. (3,10) and (-1,8)



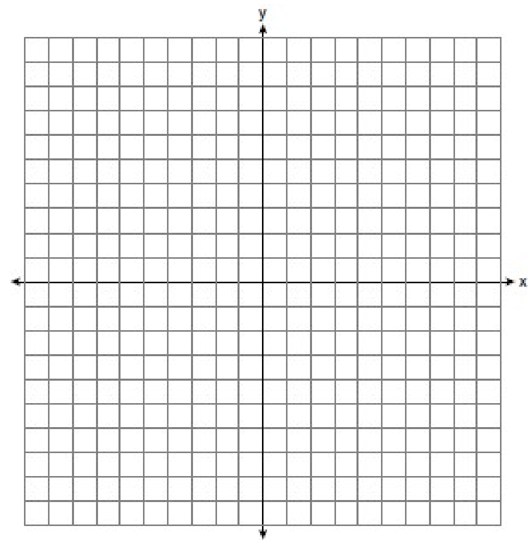
4. (3,1) and (9,-1)



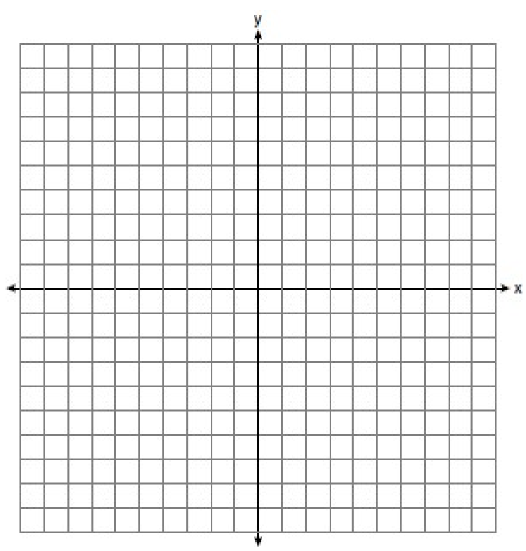
5. (-2,1) and (-4, -1)



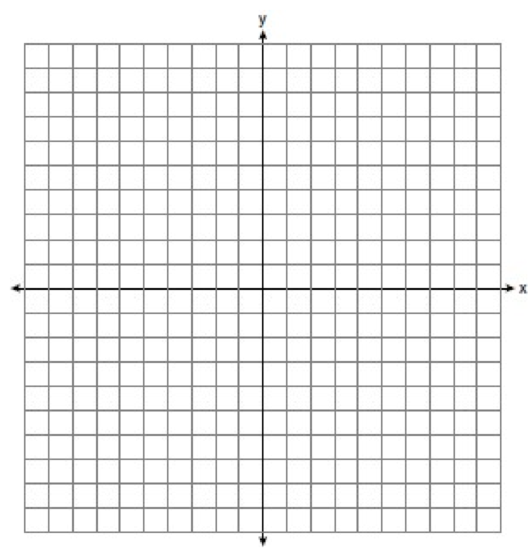
6. (10,-1) and (10, 4)



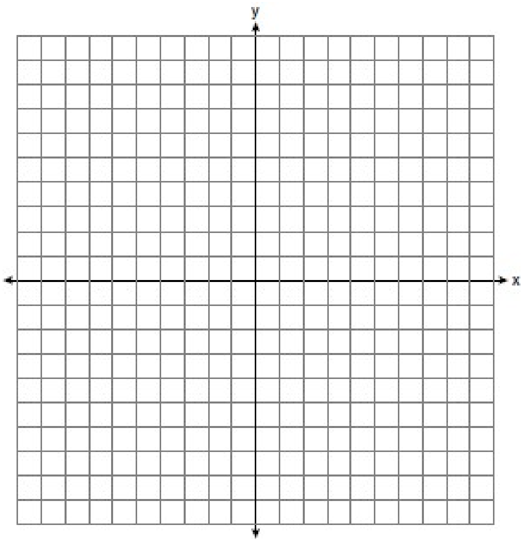
7. (8,2) and (6,4)



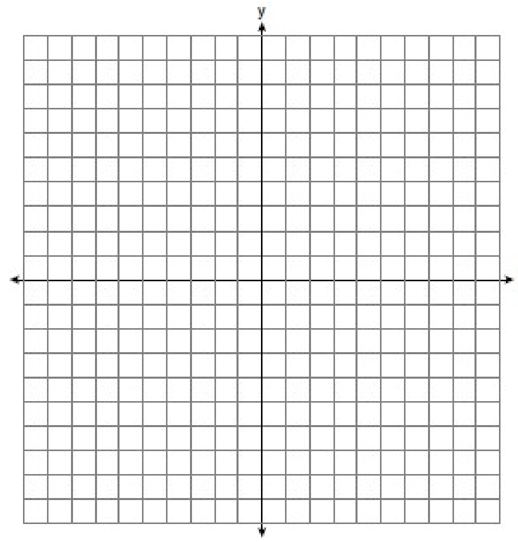
8. (-3,1) and (5,2)



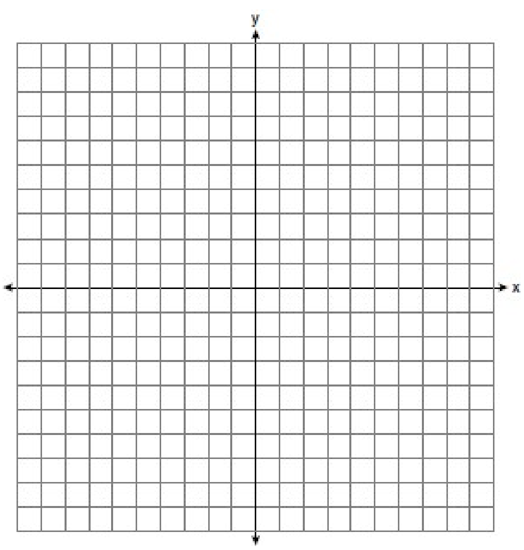
9. (-6,1) and (-3,2)



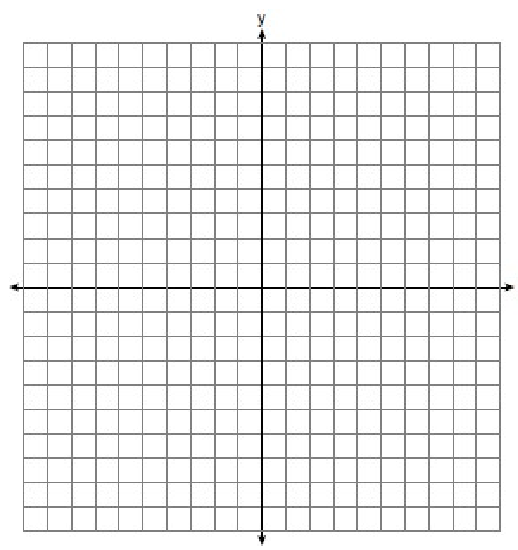
10. (0,4) and (-1, 6)



11. (-4,7) and (-2, 6)



12. (9,-2) and (-3, 8)



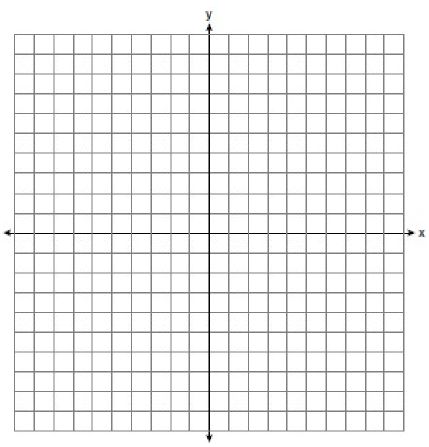
Name ______________ Date _____________

Mr. Schlansky Geometry

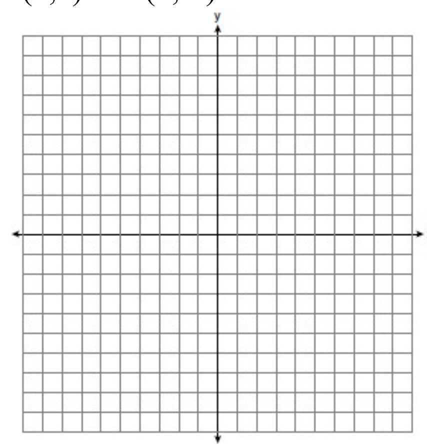
Midpoint

Find the midpoint of the segment formed by the following two points.

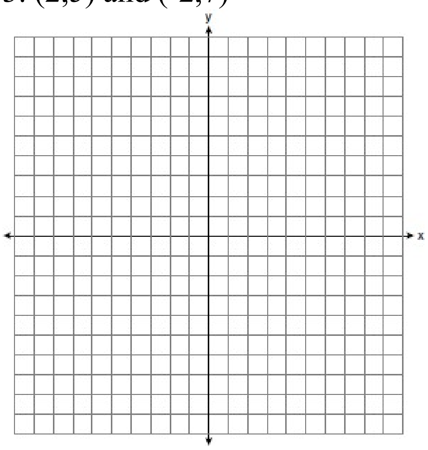
1. (5,1) and (7,5)



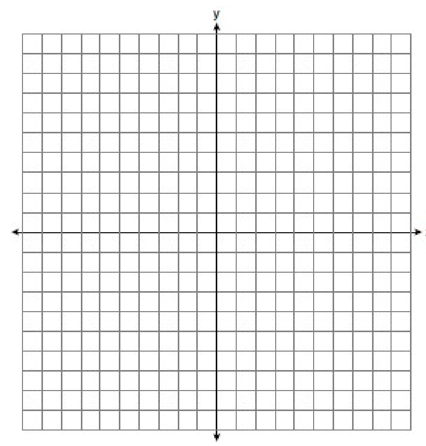
2. (9,1) and (1,-5)



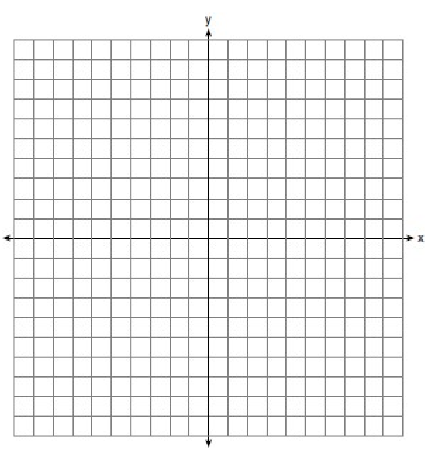
3. (2,5) and (-2,7)



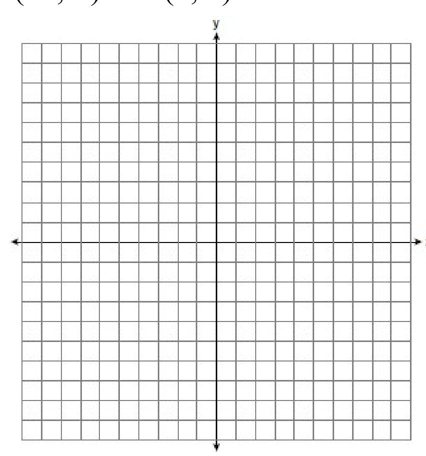
4. (3,2) and (9,0)



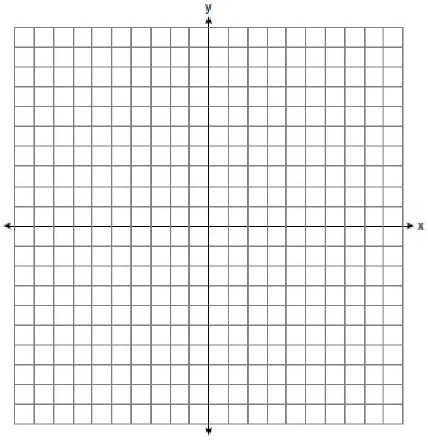
5. (-4,1) and (-4, 9)



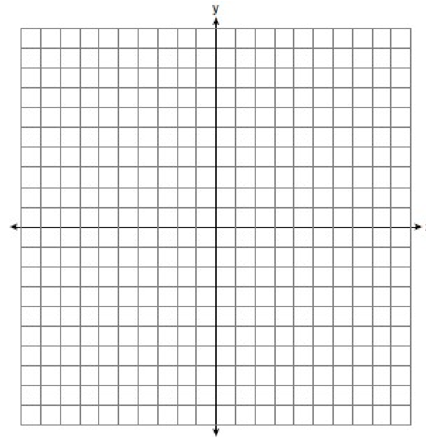
6. (10,-1) and (2, 4)



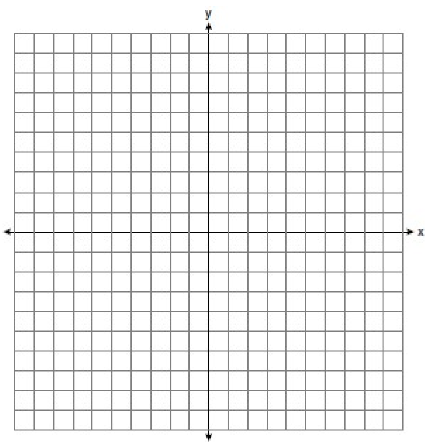
7. (-2,7) and (3, 5)



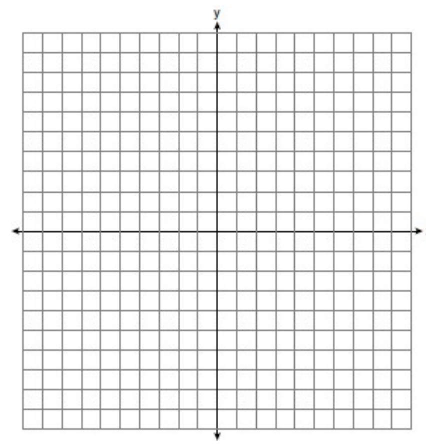
8. (9,-1) and (-1, 5)



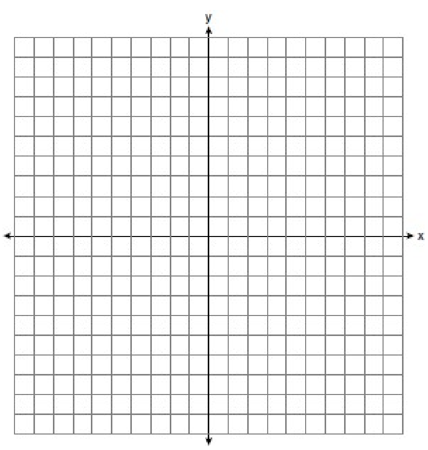
9. (-6,-3) and (-2, 1)



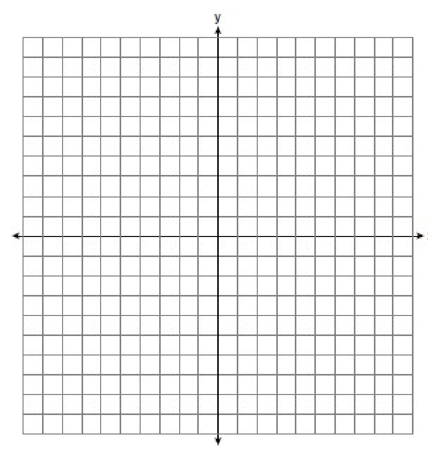
10. (-13,6) and (-1, 1)



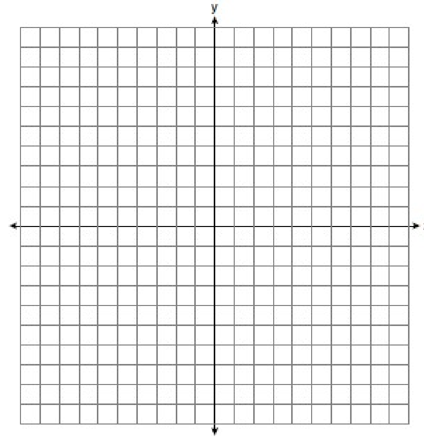
11. (-4,7) and (-2, 6)



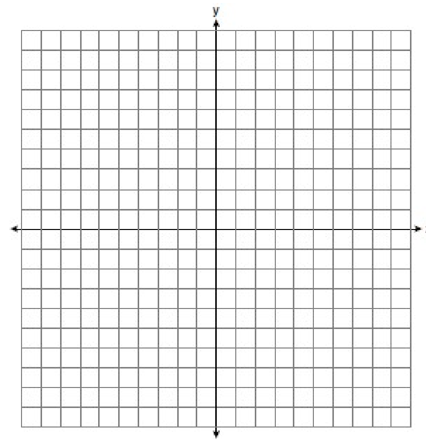
12. (9,-2) and (-3, 8)



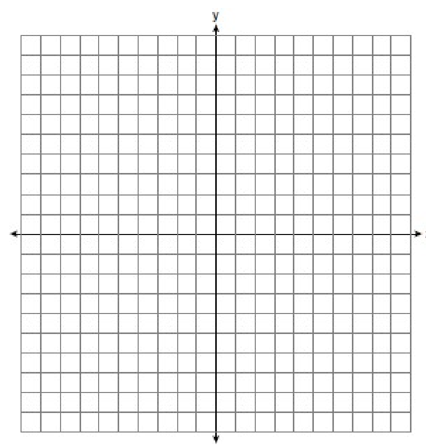
13. The midpoint of a line segment is (2,3). If one endpoint of the segment is (0,0), what is the other endpoint?



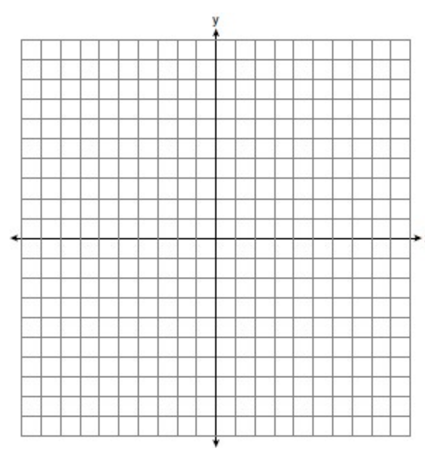
14. The midpoint M of $\overline{AB}$ is (2,-1). If the coordinates of A are (-1, 1), what are the coordinates of B?



15. The midpoint M of $\overline{XY}$ is (8,-6). If the coordinates of X are (6, -9), what are the coordinates of Y?



16. The midpoint M of $\overline{QT}$ is (-7,3). If the coordinates of Q are (-10, 9), what are the coordinates of T?



Name: _______________ Date: ______________

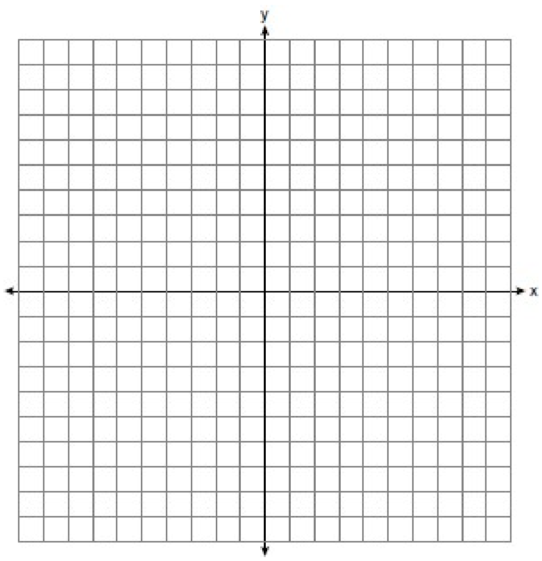
Mr. Schlansky Geometry

Slope/Distance/Midpoint Review

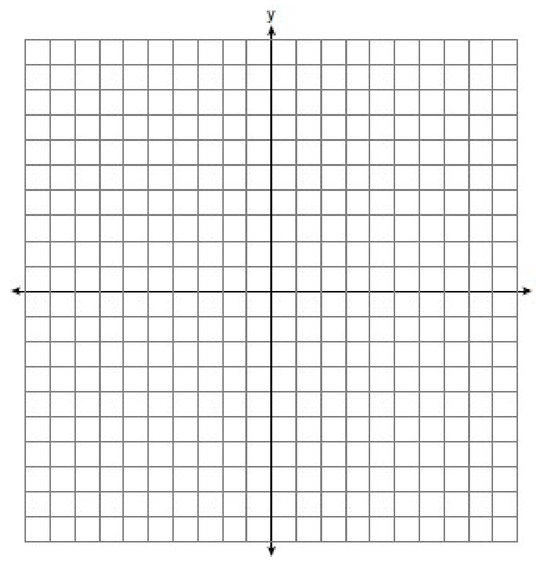
For the following sets of coordinates, find:

a) the slope
b) the midpoint
c) the distance

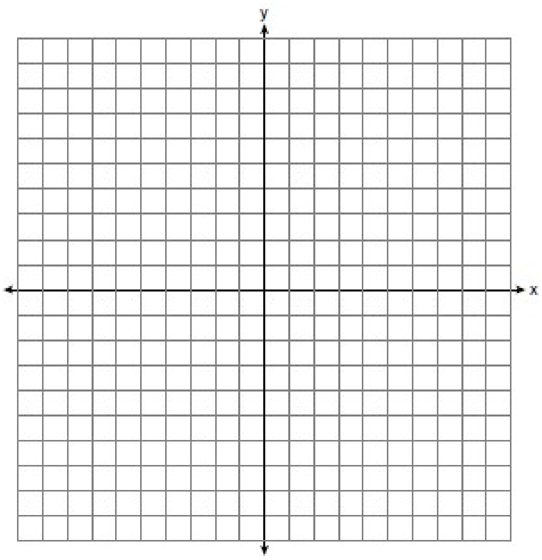
1. (-1,3) and (1,7)



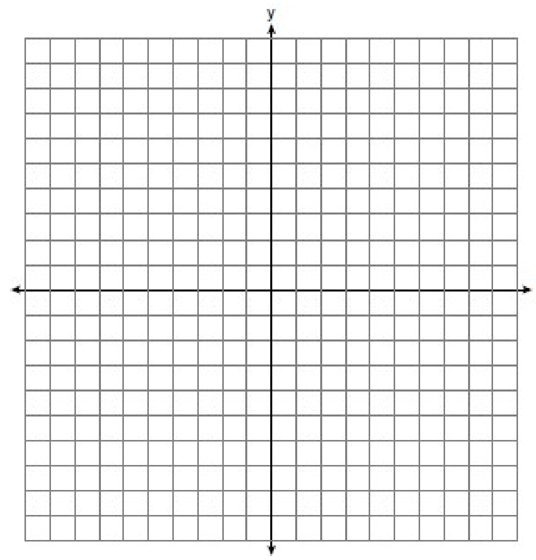
2. (4,1) and (0,5)



3. (4,-2) and (-2,2)



4. (-5,2) and (-3,0)

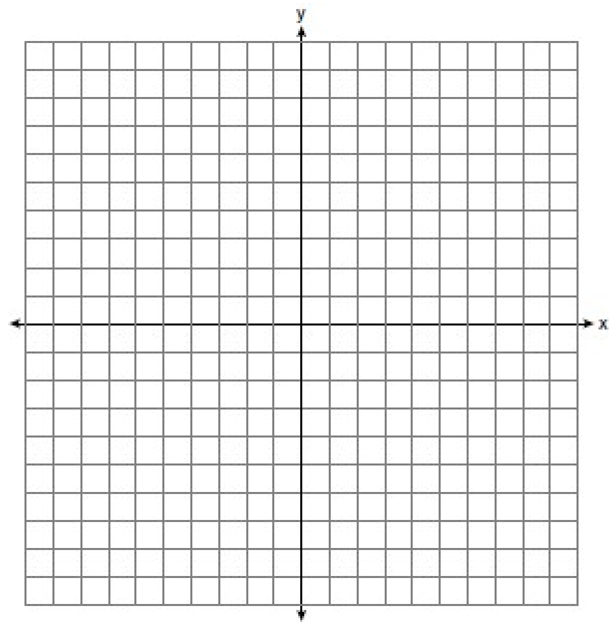


Name _____________ Date _____________
Mr. Schlansky Geometry

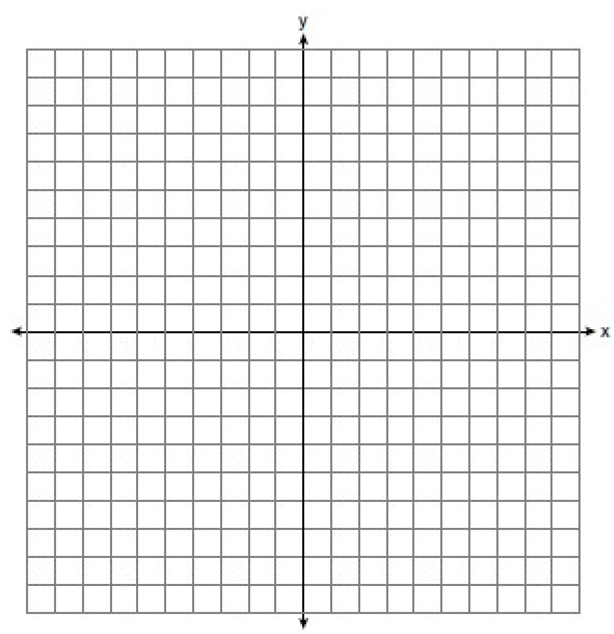
Partitions

1. What are the coordinates of the point on the directed line segment from $K(-5,-4)$ to $L(5,1)$ that partitions the segment into a ratio of 3 to 2?

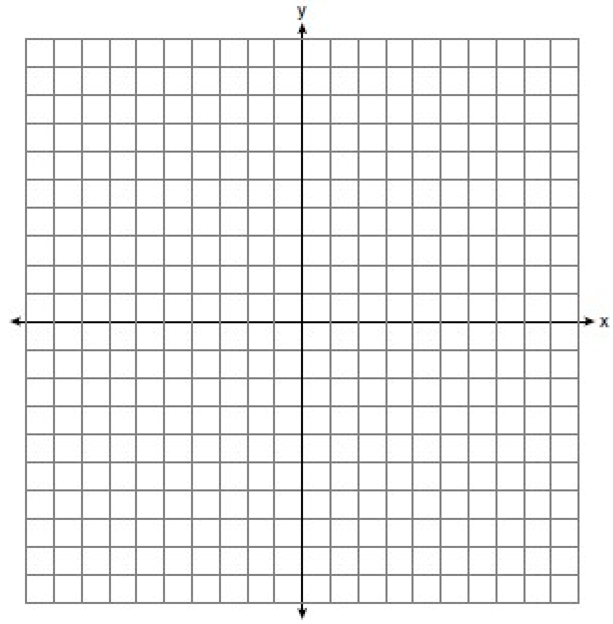
1) $(-3,-3)$
2) $(-1,-2)$
3) $\left(0,-\frac{3}{2}\right)$
4) $(1,-1)$



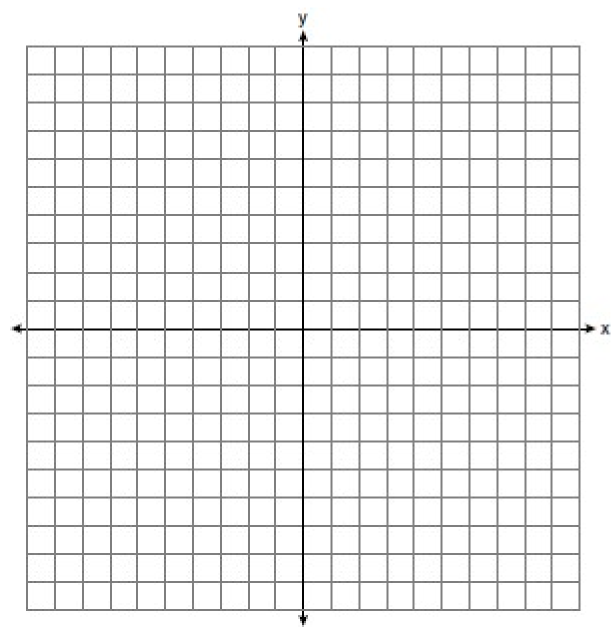
2. Directed line segment *PT* has endpoints whose coordinates are $P(-2,1)$ and $T(4,7)$. Determine the coordinates of point *J* that divides the segment in the ratio 2 to 1.



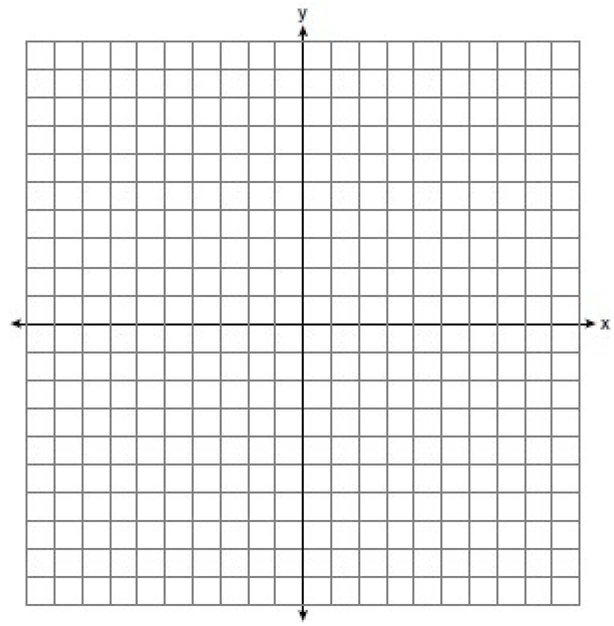
3. The coordinates of the endpoints of $\overline{AB}$ are $A(-6,-5)$ and $B(4,0)$. Point P is on $\overline{AB}$. Determine and state the coordinates of point P, such that $AP:PB$ is $2:3$.



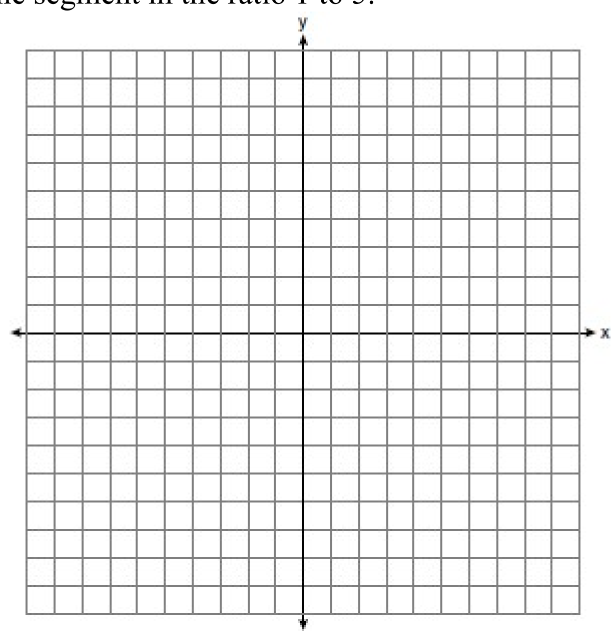
4. The endpoints of $\overline{DEF}$ are $D(-4,4)$ and $F(6,9)$. Determine and state the coordinates of point E, if $DE{:}EF = 2{:}3$.



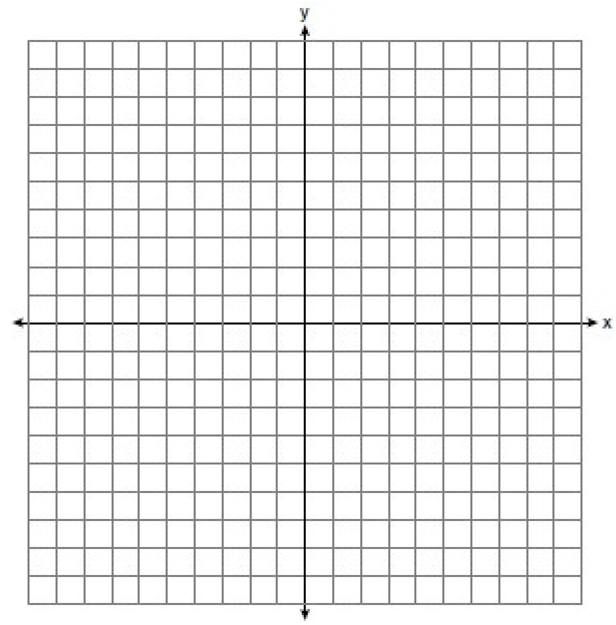
5. What are the coordinates of the point on the directed line segment from $G(-4,1)$ to $O(4,5)$ that partitions the segment into a ratio of 3 to 1?



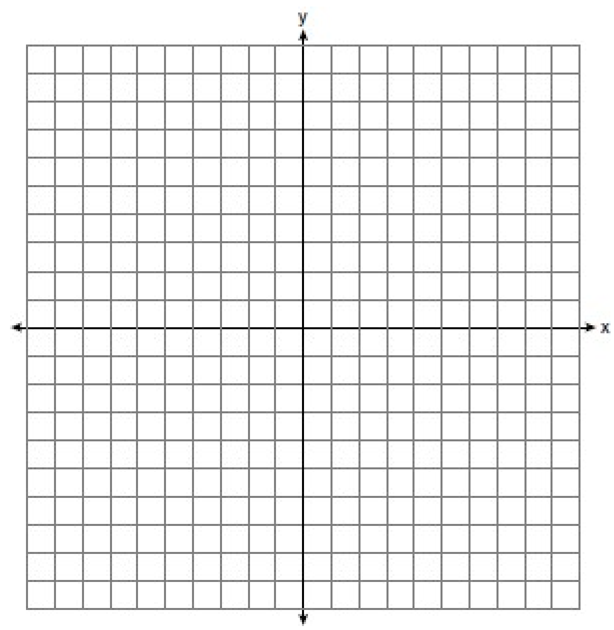
6. Directed line segment *IQ* has endpoints whose coordinates are $I(-7,8)$ and $Q(-1,-4)$. Determine the coordinates of point *J* that divides the segment in the ratio 1 to 5.



7. What are the coordinates of the point on the directed line segment from $P(-1,6)$ to $S(5,3)$ that partitions the segment into a ratio of 1 to 2?



8. Directed line segment *JQ* has endpoints whose coordinates are $J(8,6)$ and $Q(-10,-3)$. Determine the coordinates of point *O* that divides the segment in the ratio 5 to 4.



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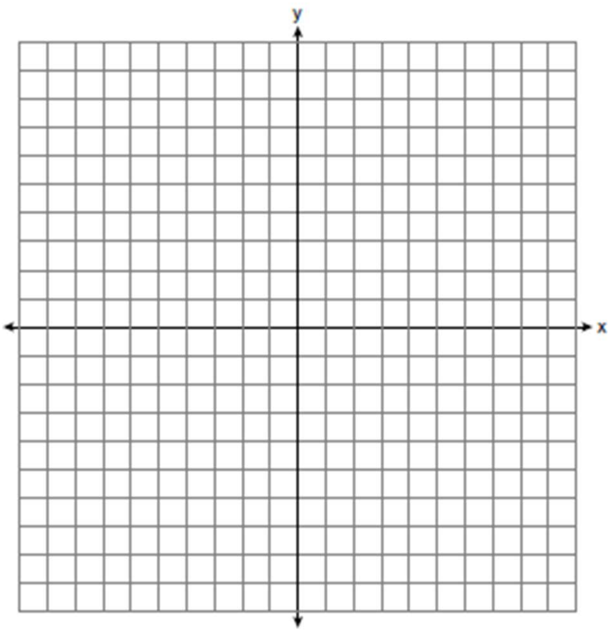
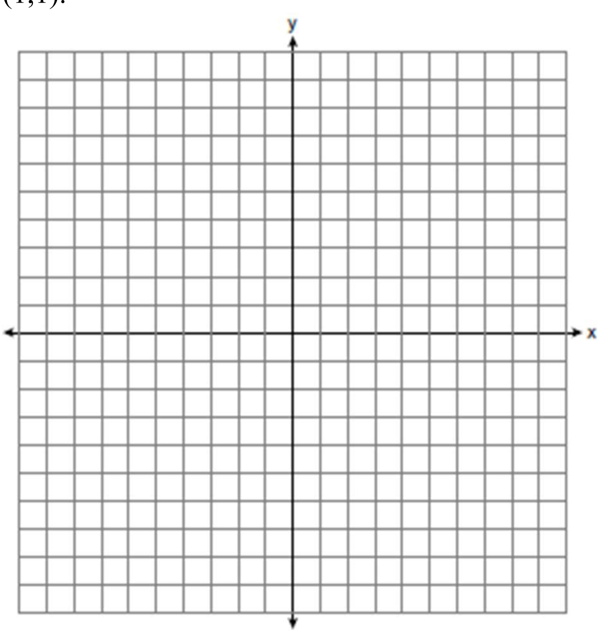
Perpendicular Bisector

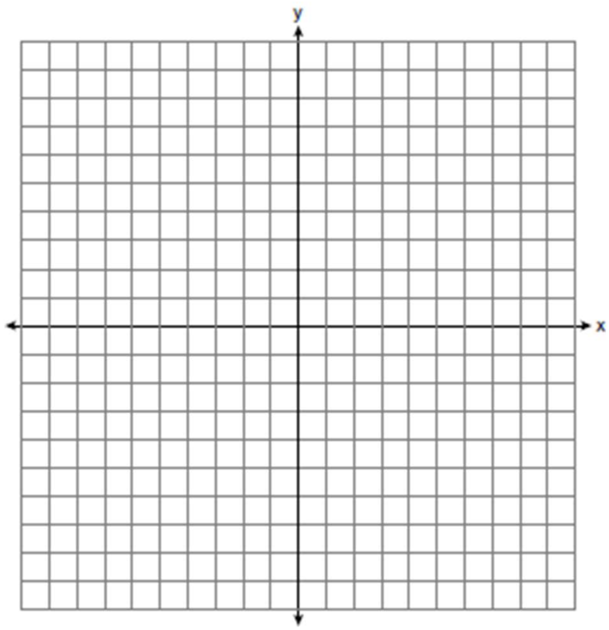
1. Write an equation of the perpendicular bisector of the line segment whose endpoints are (3,5) and (5,9).



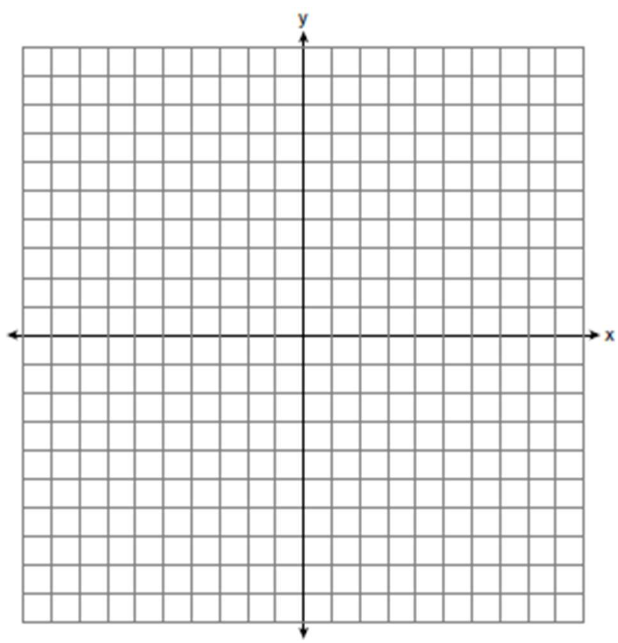
2. Write an equation of the perpendicular bisector of the line segment whose endpoints are (-1,5) and (1,1).



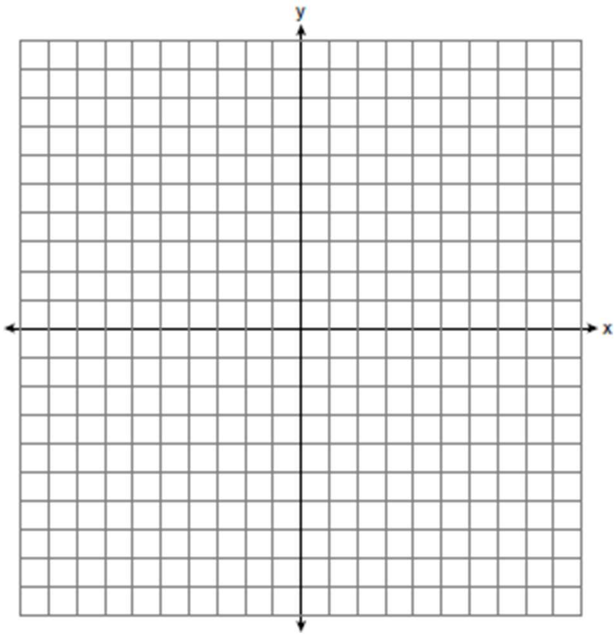
3. Write an equation of the perpendicular bisector of the line segment whose endpoints are (-4,2) and (2,6).



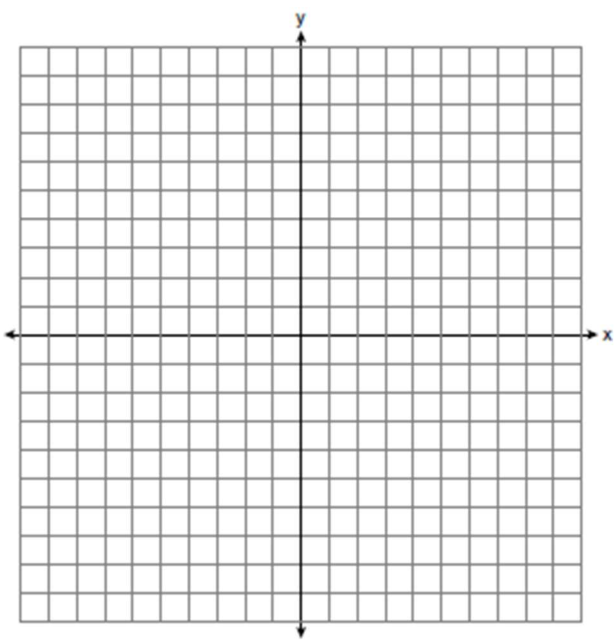
4. Write an equation of the perpendicular bisector of the line segment whose endpoints are (-4,3) and (4,5)



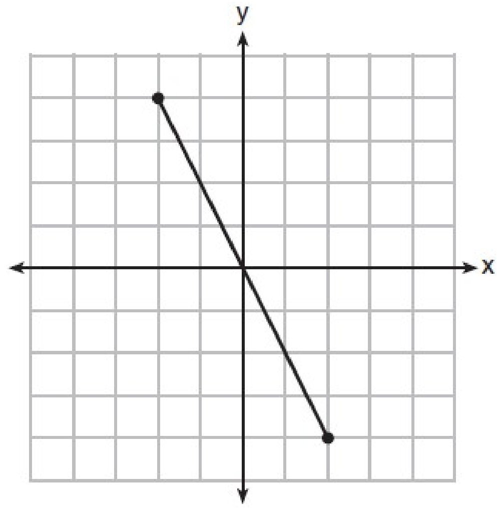
5. Write an equation of the perpendicular bisector of the line segment whose endpoints are (-8,4) and (2,2)



6. Write an equation of the perpendicular bisector of the line segment whose endpoints are $(-1, 1)$ and $(7, -5)$.



7. What is an equation of the perpendicular bisector of the line segment shown in the diagram below?



1) $y + 2x = 0$

2) $y - 2x = 0$

3) $2y + x = 0$

4) $2y - x = 0$

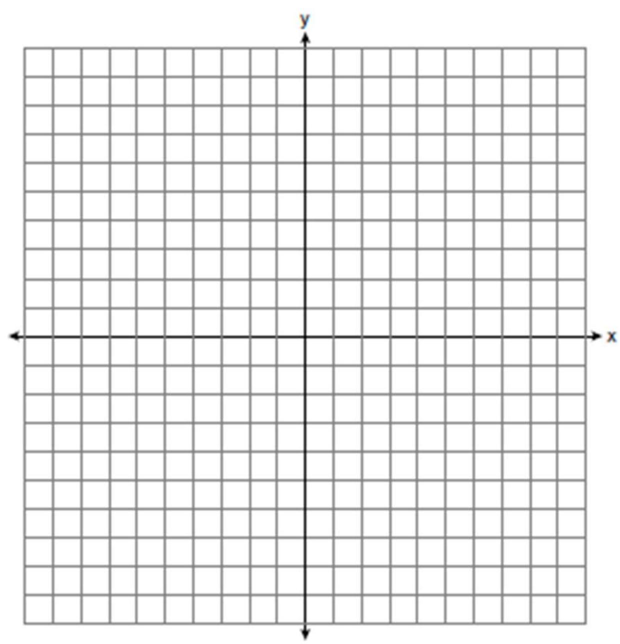
8. Line segment *NY* has endpoints $N(-11, 5)$ and $Y(5, -7)$. What is the equation of the perpendicular bisector of $\overline{NY}$?

1) $y + 1 = \frac{4}{3}(x + 3)$

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

3) $y - 6 = \frac{4}{3}(x - 8)$

4) $y - 6 = -\frac{3}{4}(x - 8)$



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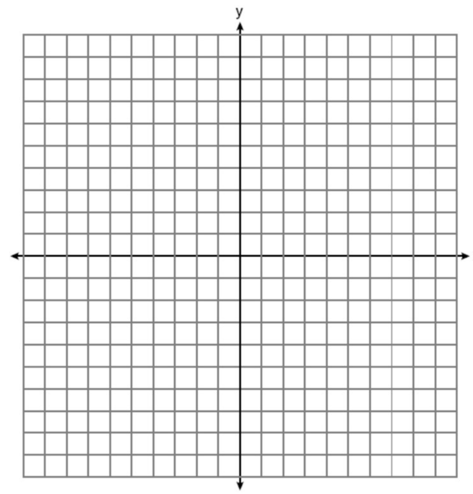
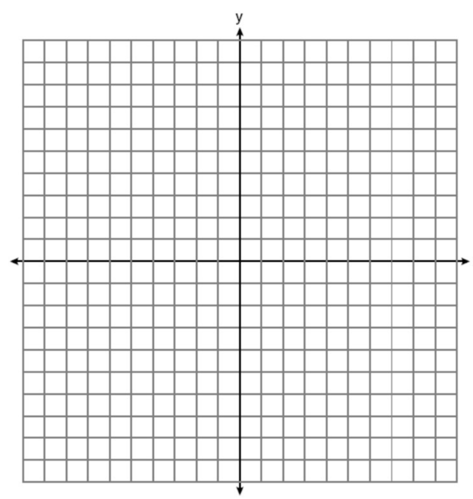
Proving Segments are Congruent

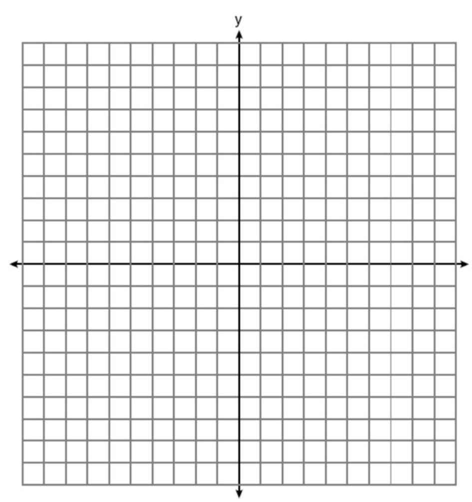
1. A(-3,2) B(1,7) C(4,-1) D(-1, -5)
Prove that $\overline{AB} \cong \overline{CD}$



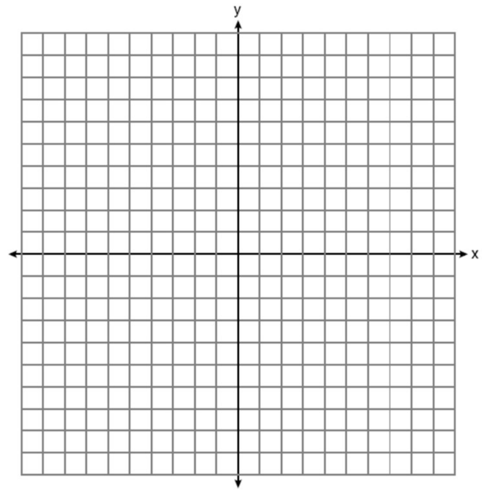
2. A(5,2), B(8,0), C(9,1), and D(7,3)
Prove that $\overline{AB} \neq \overline{CD}$



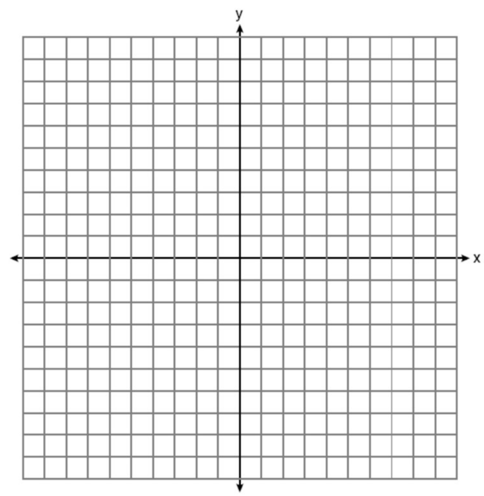
3. N(2,-3), R(6,-2), Q(8,-1), and W(4,-2)
Prove that $\overline{NR} \cong \overline{QW}$



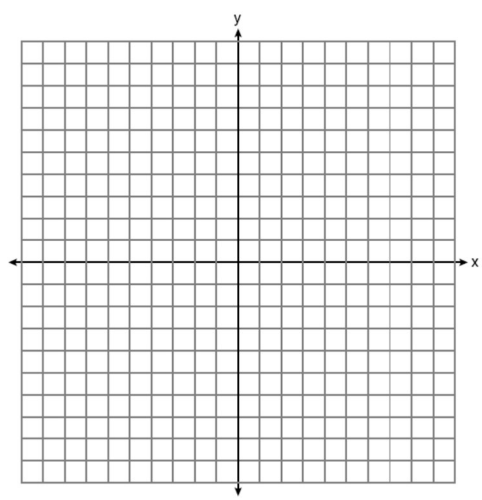
4. T(8,-6), A(-2,1), C(-4,-3), and O(6,-10)
Prove that $\overline{TA} \cong \overline{CO}$



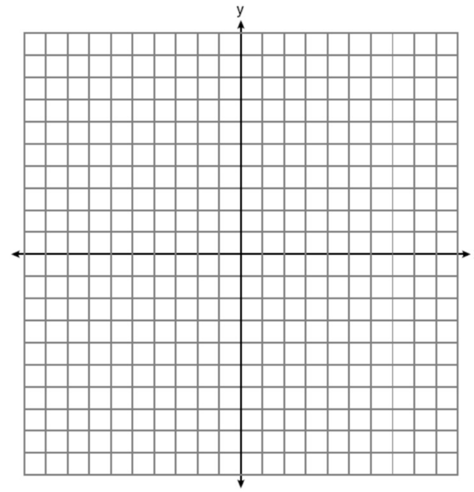
5. M(-5,2), O(5,7), P(-4,-3), and S(3,-7)
Prove that $\overline{MS} \neq \overline{PO}$



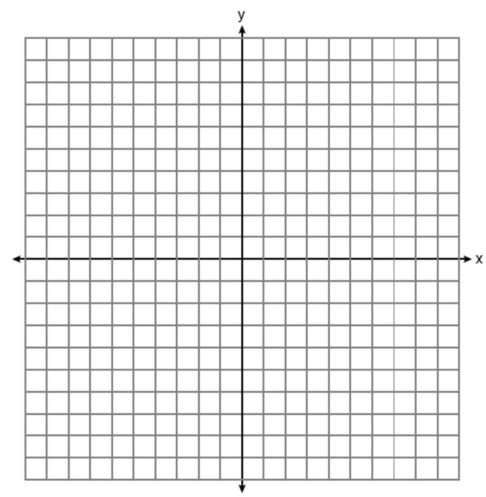
6. J(0,-2), O(-5,5), S(4,1), and H(-3,6)
Prove that $\overline{JO} \cong \overline{SH}$



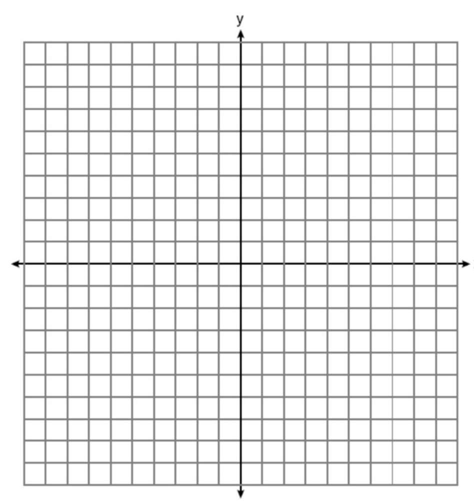
7. P(-7,0), L(-4,3), U(0,1), and M(-3,-2)
Prove that $\overline{PM} \cong \overline{LU}$



8. S(-4,7), A(5,4), B(-1,7), R(-10, 0)
Prove that $\overline{SA} \neq \overline{BR}$



9. M(8,9), I(-1,4), L(3,-1), R(8, 8)
Prove that $\overline{MI} \cong \overline{LR}$



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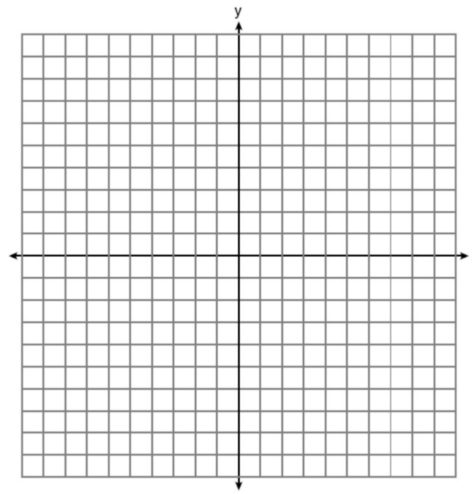
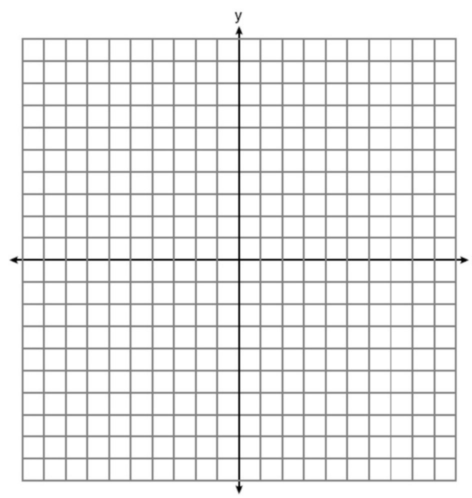
Proving Segments are Parallel/Perpendicular

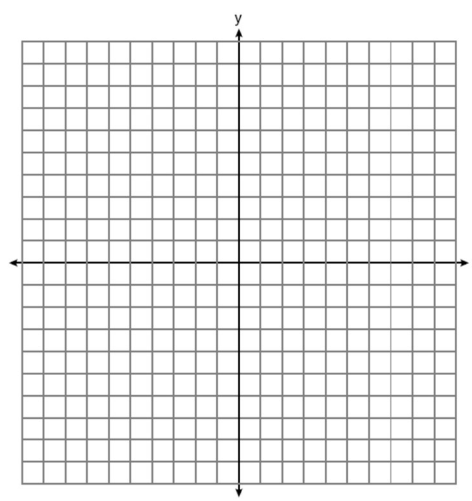
1. A(-5,2) B(0,4) C(-2,-2) D(8,2)
Prove $\overline{AB} \parallel \overline{CD}$



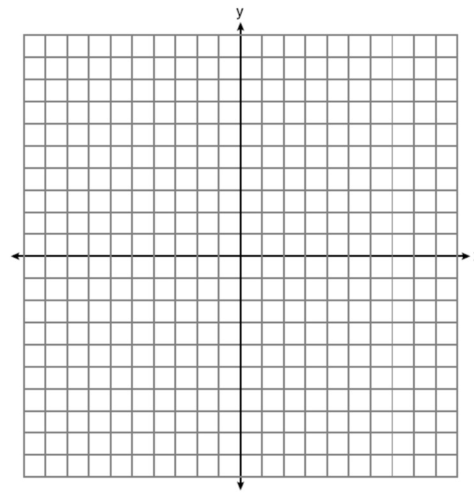
2. F(2,5) I(5,7) S(4,2) H(-2,-2).
Prove $\overline{FI} \parallel \overline{SH}$



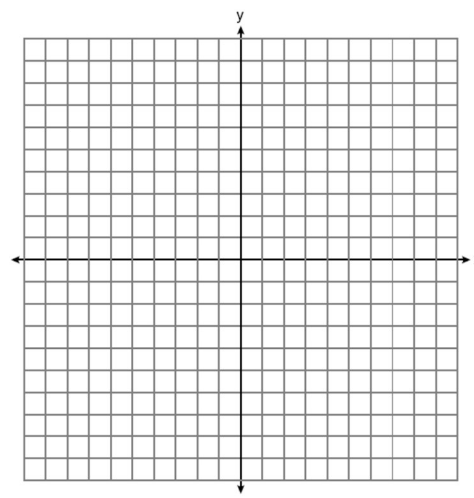
3. J(-1,3) O(3,1) S(3,-1) and E(5,-2).
Prove $\overline{JO} \parallel \overline{ES}$



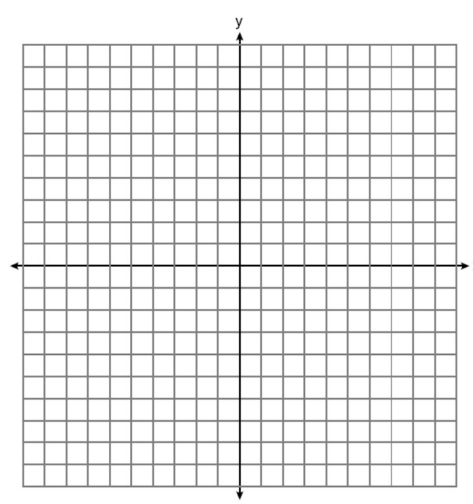
4. A(2,2) B(4,5) C(7,3)
Prove that $\overline{AB} \perp \overline{BC}$



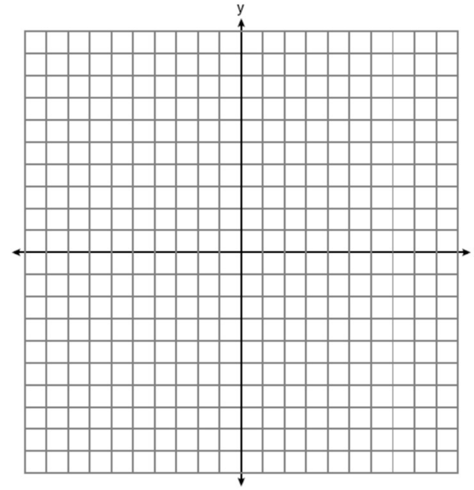
5. F(2,5) I(4,8), H(10,4).
Prove $\overline{FI} \perp \overline{IH}$



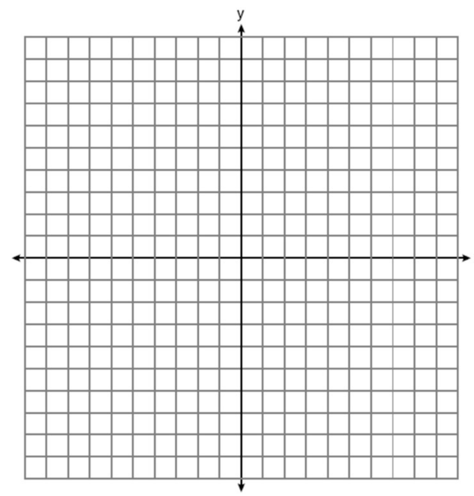
6. M(-3,-1), E(-5,-5), S(3,-9).
Prove $\overline{ME} \perp \overline{ES}$



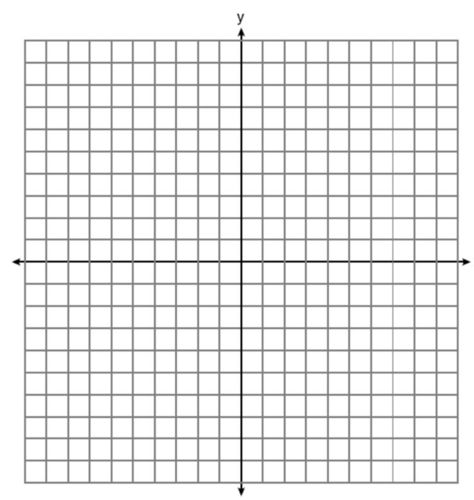
7. T(-8,8) A(8,-4) C(0,3) and O(-8,9).
Prove $\overline{TA} \parallel \overline{CO}$



8. A(2,2), B(4,-2), C(9,1).
Prove $\overline{AB}$ *not* $\perp \overline{BC}$



9. S(-9,-2), A(6, -8), B(8,2), R(-2,6)
Prove $\overline{SA} \parallel \overline{BR}$



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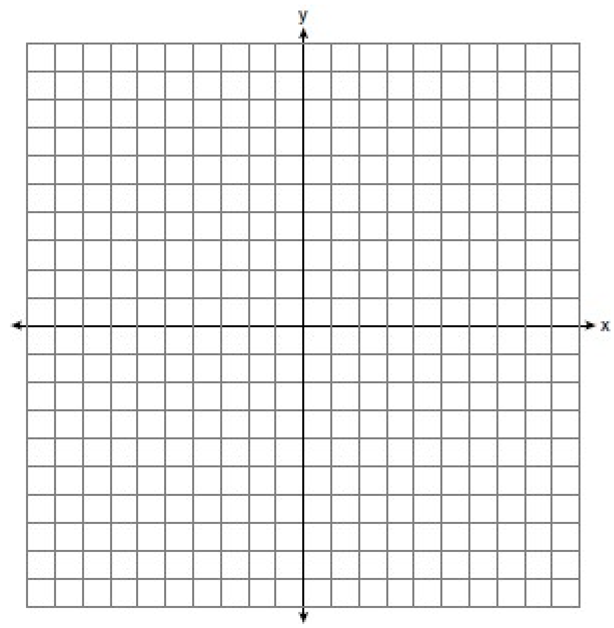
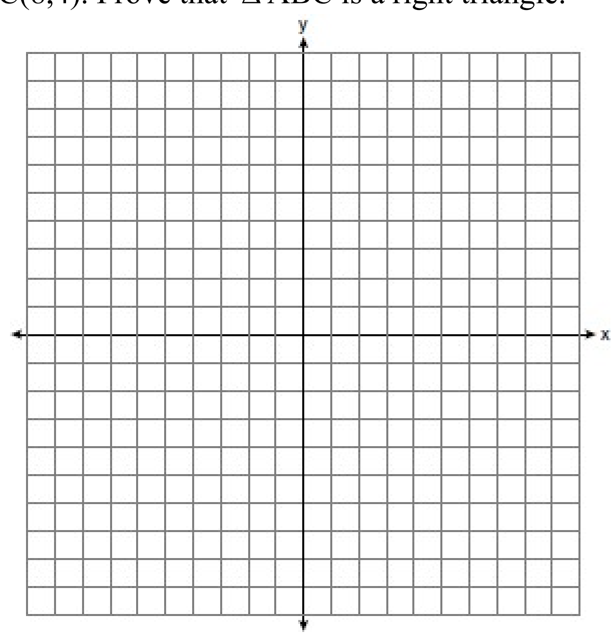
Geometry

Coordinate Geometry Triangle Proofs

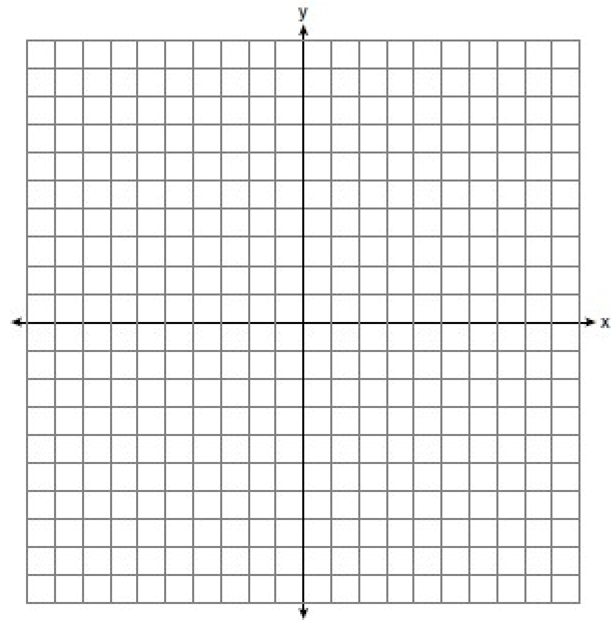
1. Triangle MET has vertices M(7,-1), E(2,-2) and T(3,3). Prove that MET is an isosceles triangle.



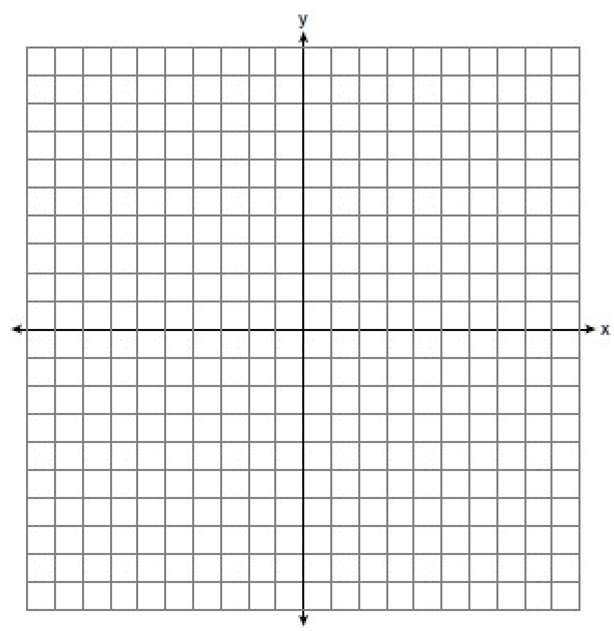
2. The vertices of ΔABC are A(0,10) B(5,0) and C(8,4). Prove that ΔABC is a right triangle.



3. Triangle JOY has vertices J(4,0), O(5,4) and Y(1,5). Prove that JOY is an isosceles right triangle.



4. Prove that the triangle whose vertices are A(0,2), B(2,3), and C(1,5) is a right triangle.



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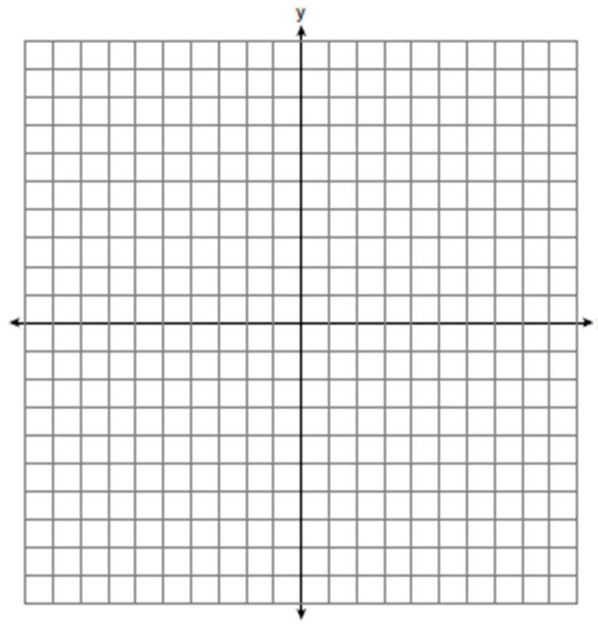
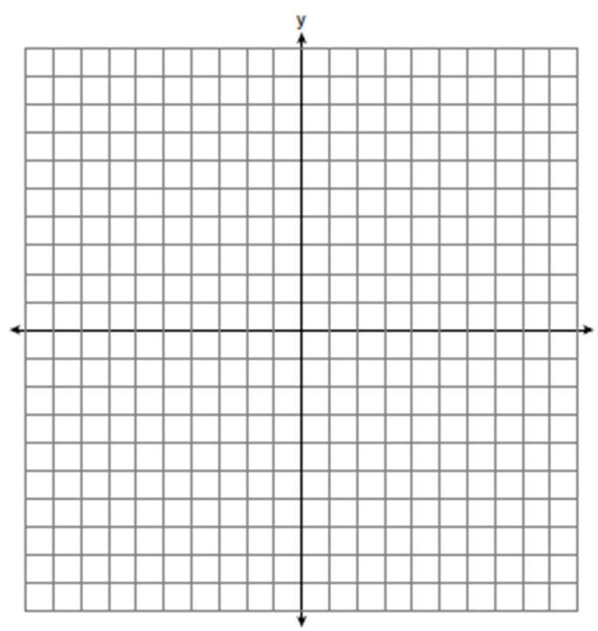
Parallelogram Coordinate Geometry Proofs

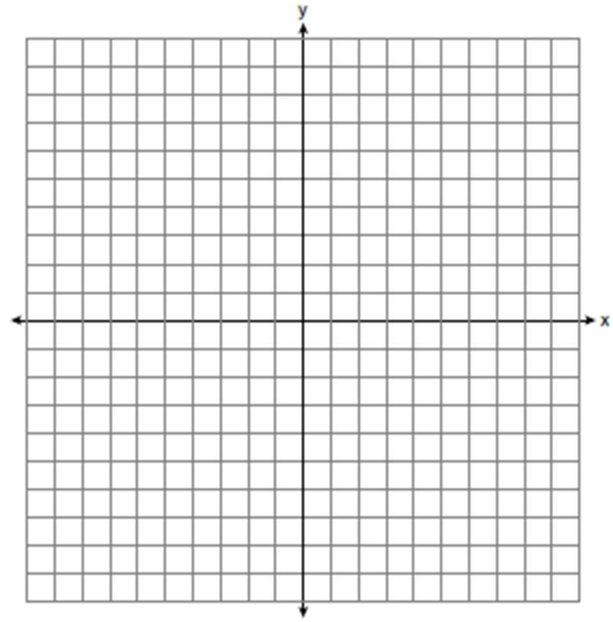
1. Quadrilateral *MATH* has vertices M(-2, -3), A(-1, 1), T(4, 4), and H(3, 0). Prove that *MATH* is a parallelogram.



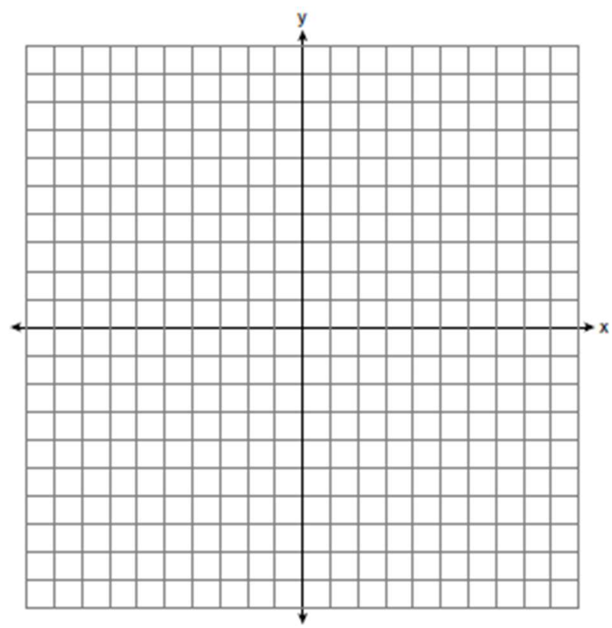
1. Quadrilateral *WEAK* has vertices W(-3,2), E(0, -3), A(10,3), and K(7,8). Prove that quadrilateral *WEAK* is a rectangle.



3. The coordinates of the vertices of quadrilateral *ROCK* are R(-7,4), O(-2,9), C(5,8), and K(0,3). Prove that quadrilateral *ROCK* is a rhombus.



4. The coordinates of the vertices of quadrilateral *ABCD* are A(2,0), B(6,-4), C(10,0), and D(6,4). Prove that quadrilateral ABCD is a square.



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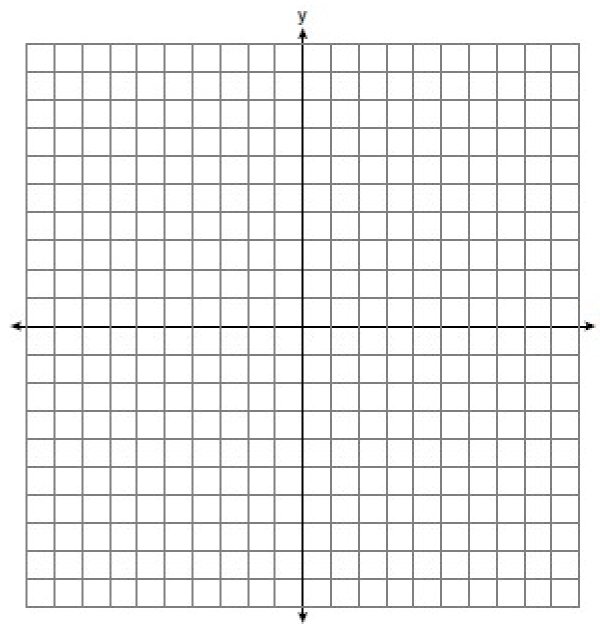
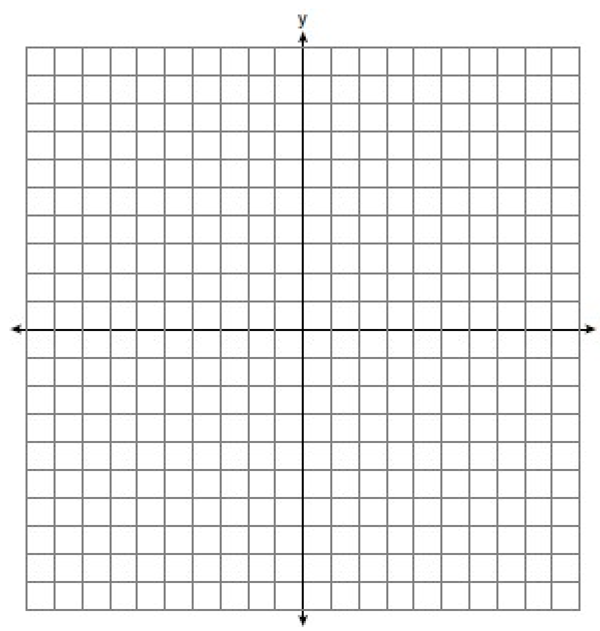
Coordinate Geometry Trapezoid Proofs

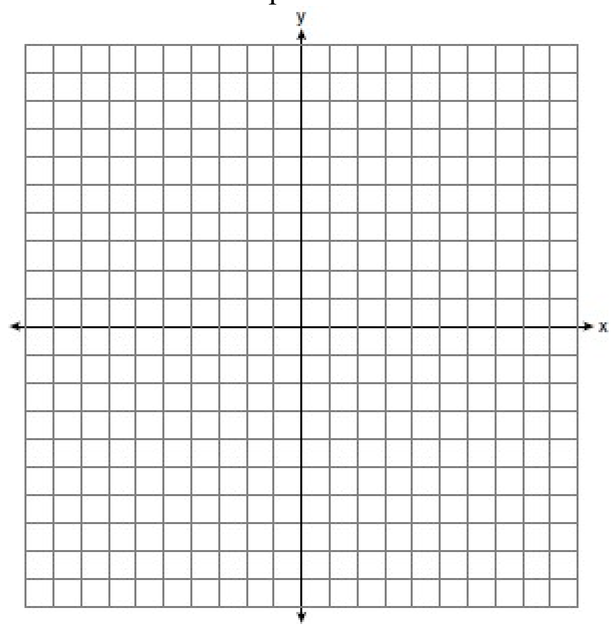
1. Quadrilateral ABCD has vertices A(1,1), B(2,5), C(5,7) and D(7,5). Prove that quadrilateral ABCD is a trapezoid.



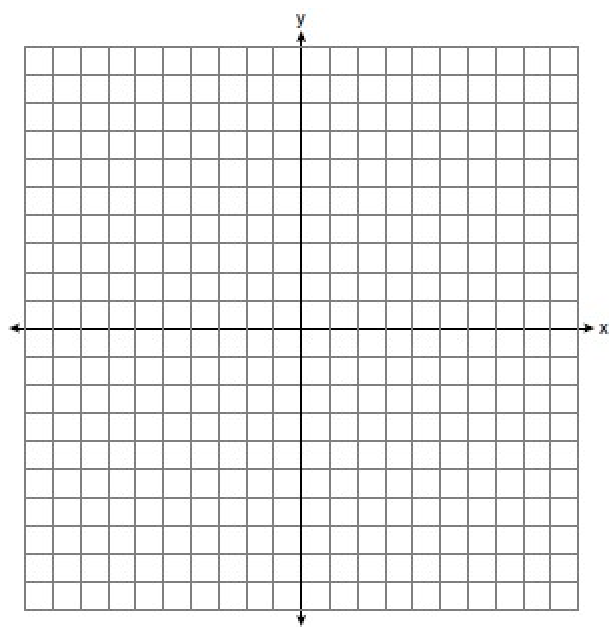
2. Quadrilateral DEFG has vertices D(1,3) E(-1,1) F(-1,-2) G(4,3). Prove that DEFG is an isosceles trapezoid.



3. Given $C(-7,-3)$, $A(-7,2)$, $M(-1,5)$, $I(3,2)$. Prove $CAMI$ is an isosceles trapezoid.



4. Given $M(-5,7)$, $I(-1,10)$, $L(9,5)$, $O(-3,-4)$. Prove $MILO$ is an isosceles trapezoid.



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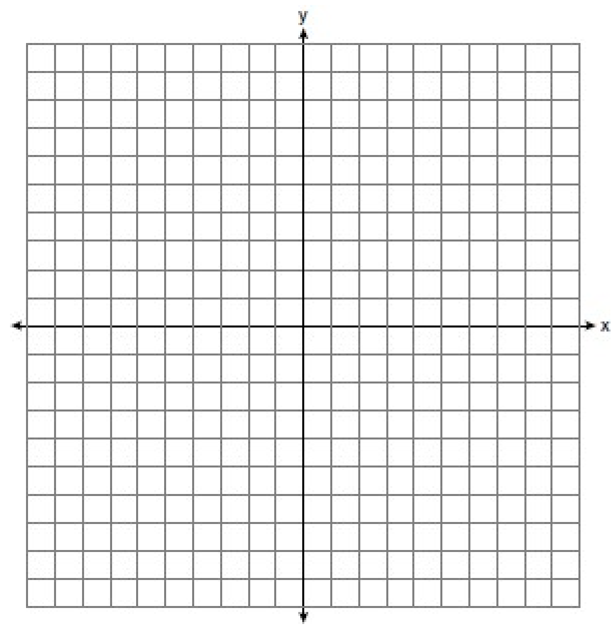
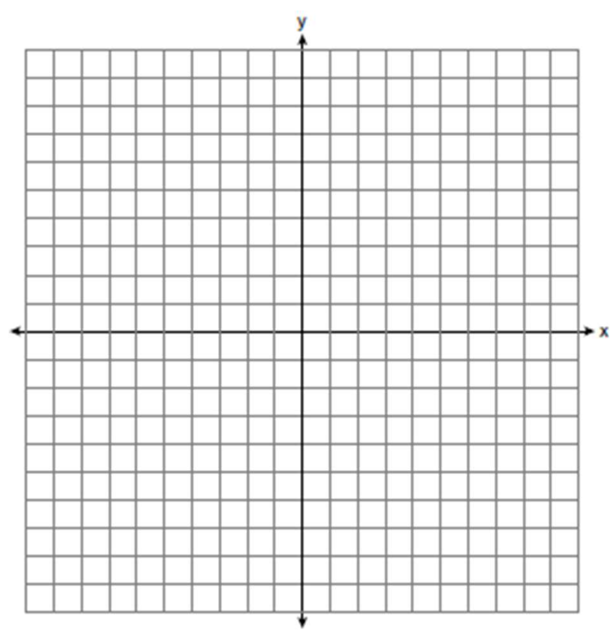
Coordinate Geometry Not Proofs

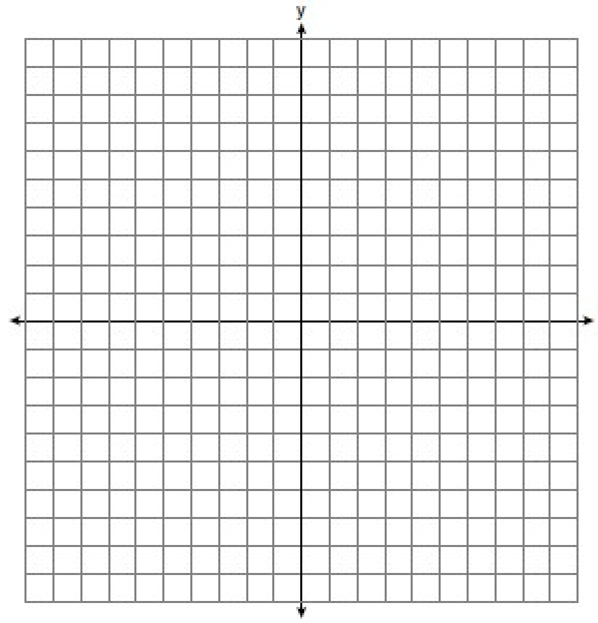
1. Prove that the triangle whose vertices are A(-6,6), B(-5,2), and C(3,4) is a right triangle but *not* isosceles.



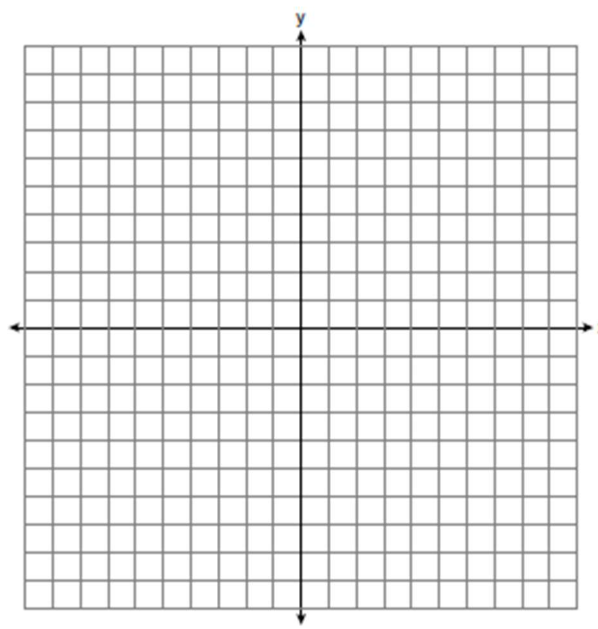
2. Quadrilateral *FRDY* has vertices F(-2, -8), R(7,-1), D(10,10) and Y(1,3). Using coordinate geometry, prove that quadrilateral *FRDY* is a rhombus but *not* a square.



3. The coordinates of quadrilateral JKLM are J(1,-2), K(13,4), L(6,8), and M(-2,4). Prove that quadrilateral JKLM is a trapezoid but not an isosceles trapezoid.



4. Quadrilateral *FUNK* has vertices F(-1, 3), U(1,6), N(7,2) and K(5,-1). Using coordinate geometry, prove that quadrilateral *FUNK* is a rectangle but *not* a square.



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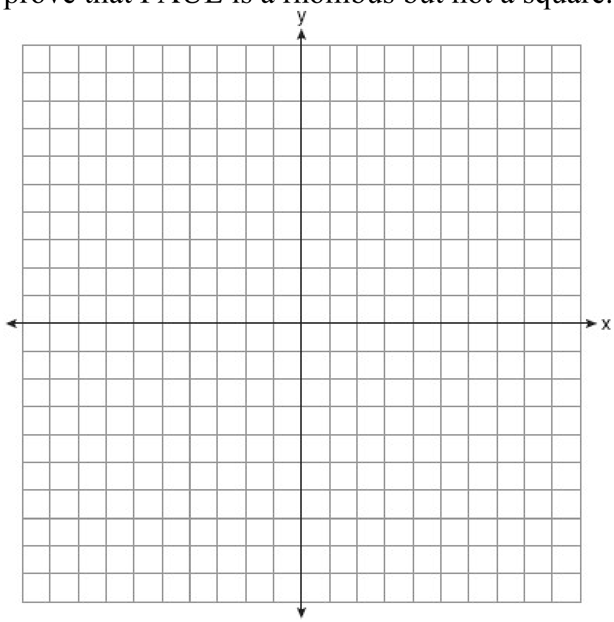
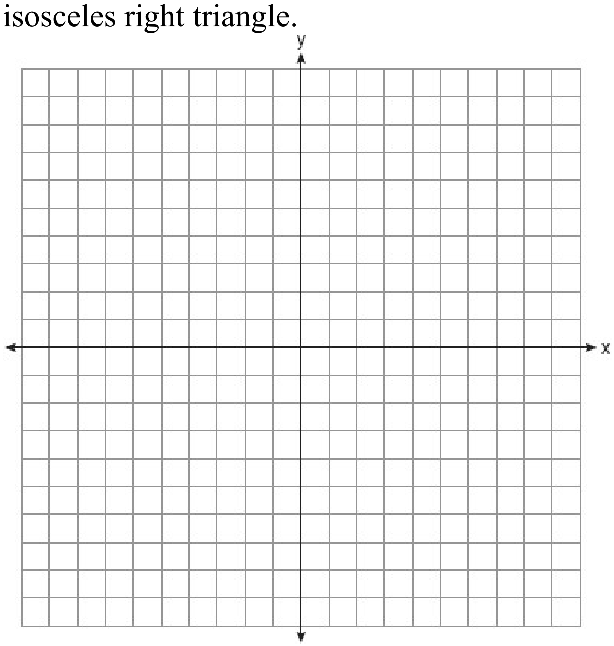
Coordinate Geometry Proofs Practice

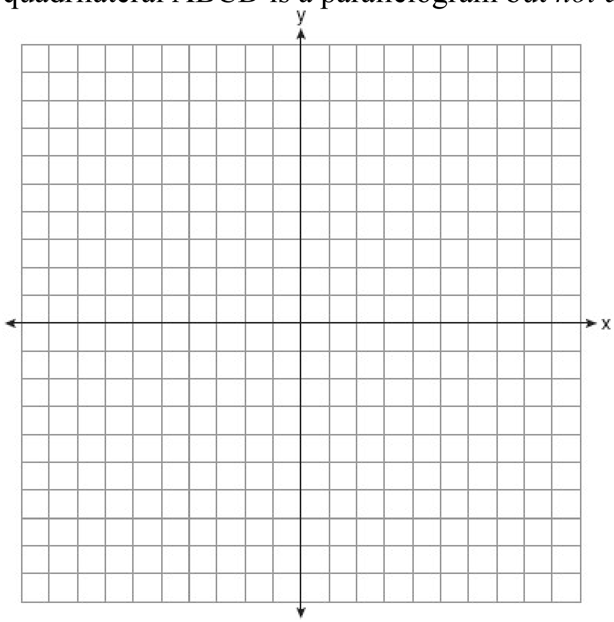
1. Rhombus PAUL has vertices P(2,6) A(6,8), U(10,6), and L(6,4). Using coordinate geometry, prove that PAUL is a rhombus but not a square.



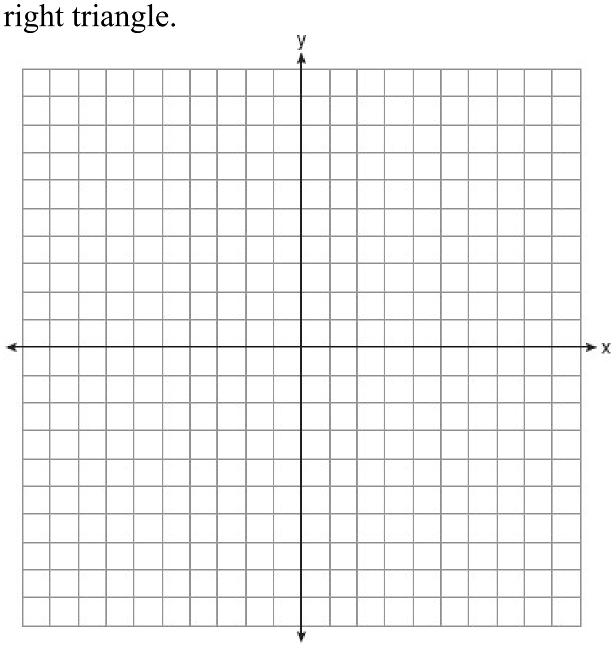
2. Triangle USA has vertices U(4,-7), S(-3,-4), and A(7,0). Prove that triangle USA is an isosceles right triangle.



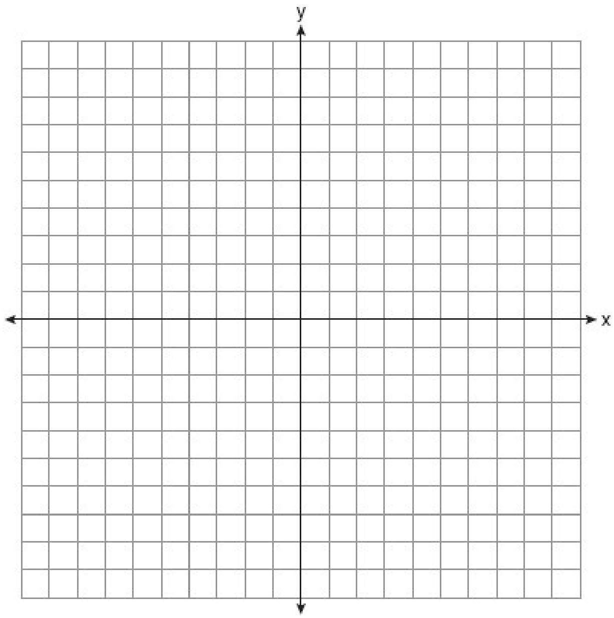
3. The coordinates of quadrilateral ABCD are A(-3,-8), B(6,-1), C(9,10), and D(0,3). Prove that quadrilateral ABCD is a parallelogram but *not* a rectangle.



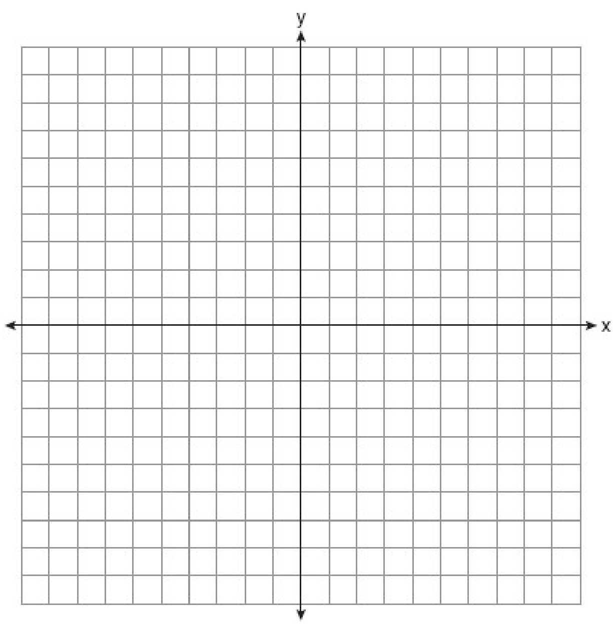
4. Triangle ABC has vertices A(1,1), B(2,5), and C(6,4). Prove that triangle ABC is an isosceles right triangle.



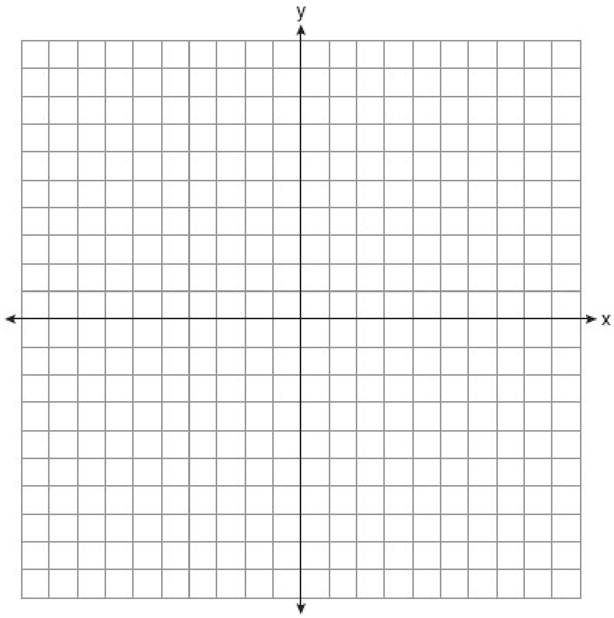
5. Quadrilateral *PQRS* has vertices $P(-2,3)$, $Q(3,8)$, $R(4,1)$, and $S(-1,-4)$. Prove that *PQRS* is a rhombus. Prove that *PQRS* is *not* a square.



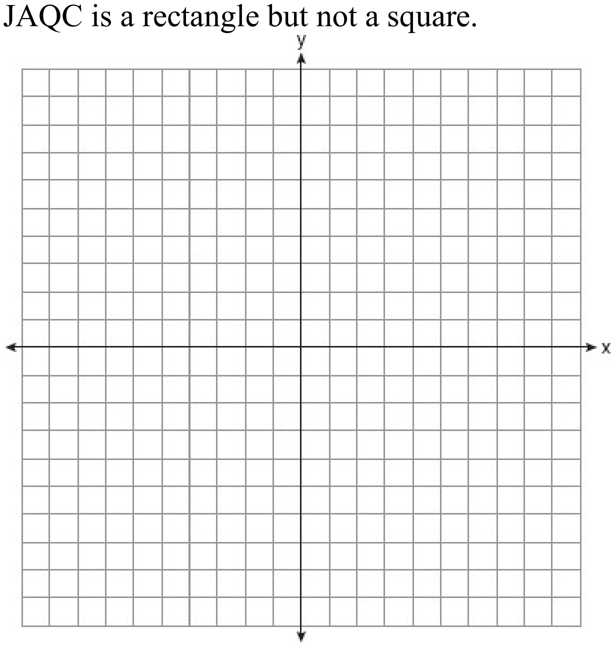
6. Quadrilateral ABCD has vertices A(3,1) B(-3,5) C(5,4) and D(2,6). Prove quadrilateral ABCD is a trapezoid but *not* an isosceles trapezoid.



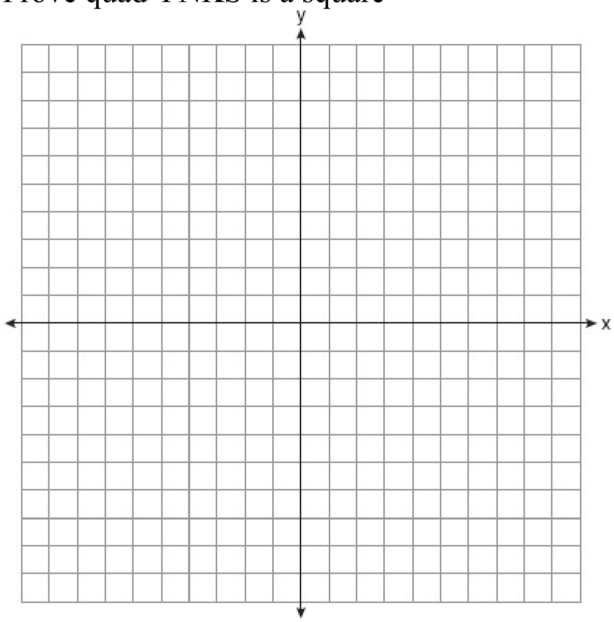
7. The coordinate of quadrilateral TACO are T(-4,0), A(-3,3), C(2,2), and O(1,-1). Prove that TACO is a parallelogram but not a rhombus.



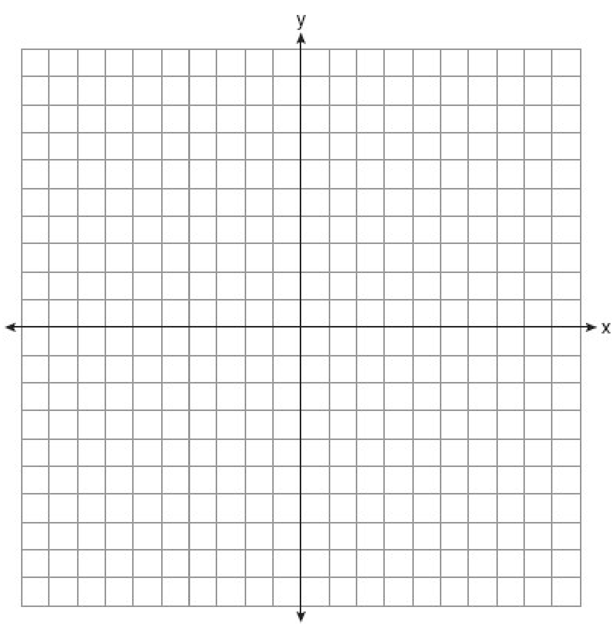
8. Quadrilateral JAQC has vertices J(2,-4), A(8,0), C(0,-1), and Q(6,3). Prove that quadrilateral JAQC is a rectangle but not a square.



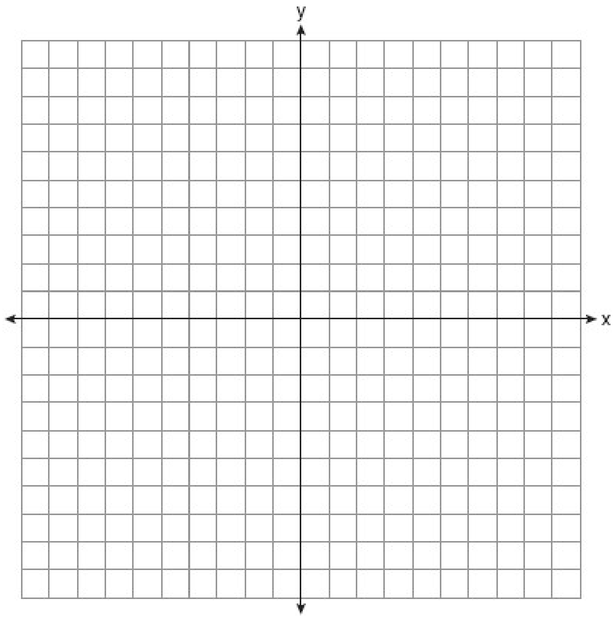
9. Quad YNKS has vertices Y(3,0) N(6,-4) K(10,-1) S(7,3).
Prove quad YNKS is a square



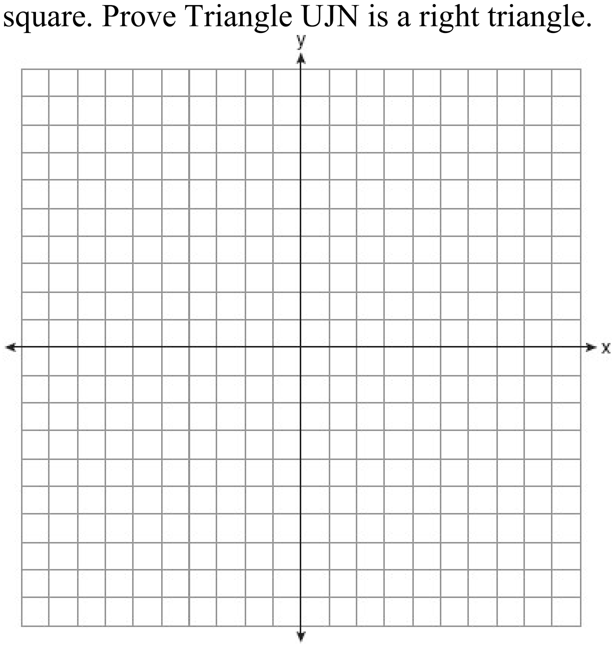
10. Triangle MET has vertices M(-8,-2), E(-6,4), and T(-3,3). Prove that triangle MET is a right triangle.



11. Quadrilateral TOBY has vertices T(-4, -8), O(5,-1), B(8,10) and Y(-1,3). Using coordinate geometry, prove that quadrilateral TOBY is a rhombus but not a square.



12. Quadrilateral JUAN has vertices J(-4,-1), U(-1,4), A(4,1), and N(1,-4). Prove JUAN is a square. Prove Triangle UJN is a right triangle.



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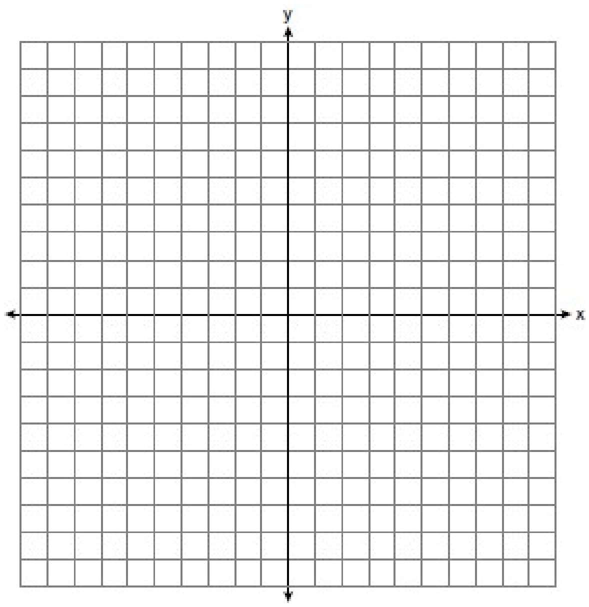
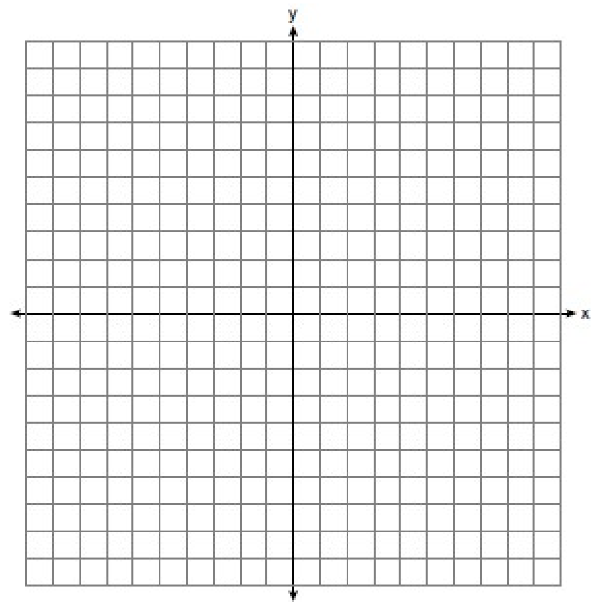
Creating Parallelograms

For each of the following, use the three given points to find the fourth point that makes a parallelogram.

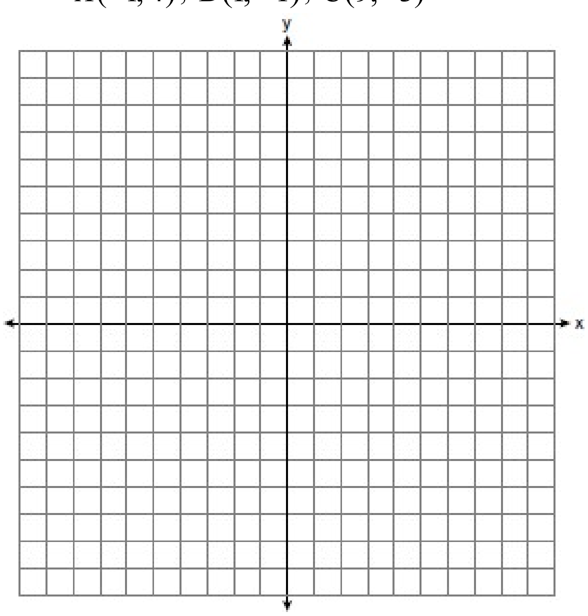
1. $A(-4,1)$, $B(2,3)$, $C(1,-1)$



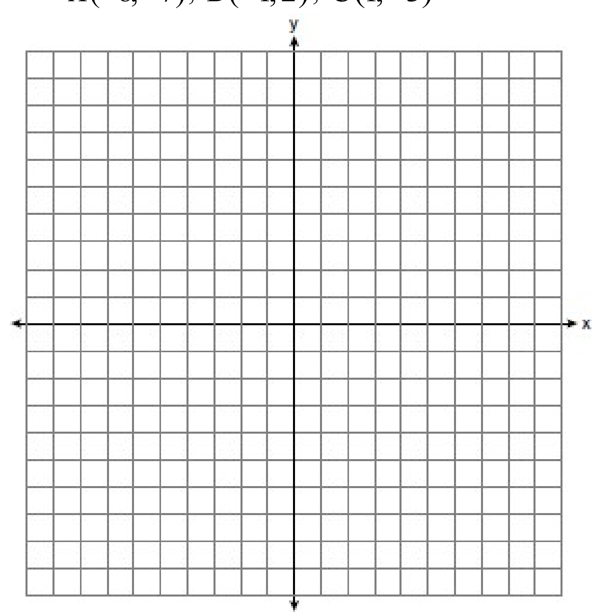
2. $A(5,4)$, $B(8,-2)$, $C(7,-5)$



3. $A(-1,4)$, $B(1,-1)$, $C(9,-3)$

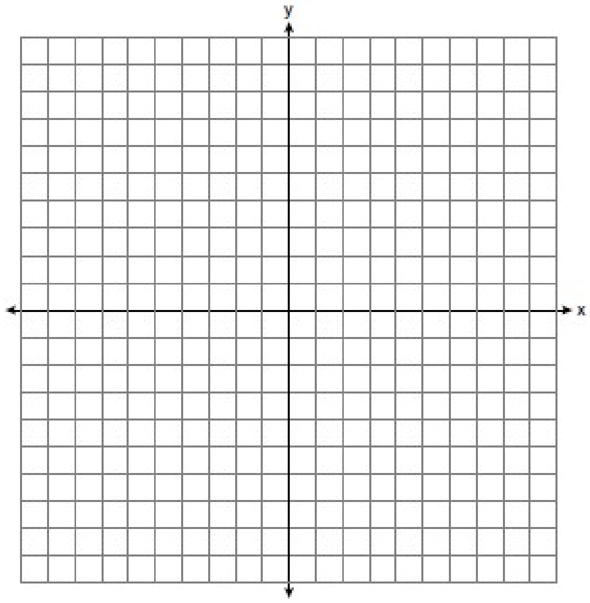


4. $A(-8,-7)$, $B(-1,2)$, $C(1,-3)$

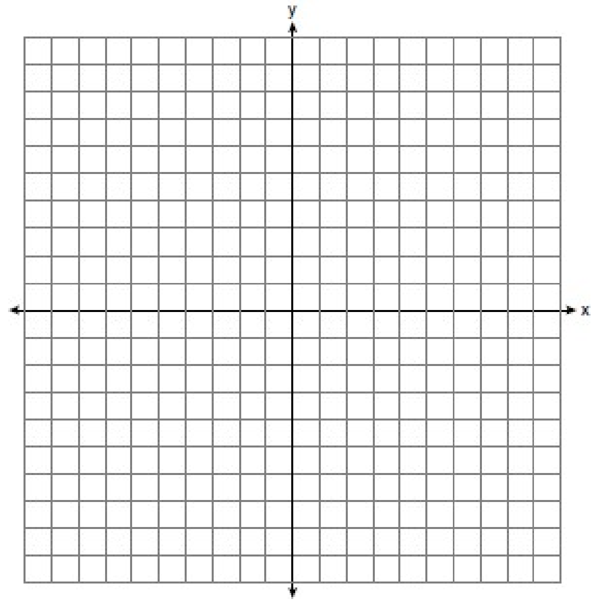


For each of the following, use the three given points to find the fourth point that makes the shape a rectangle

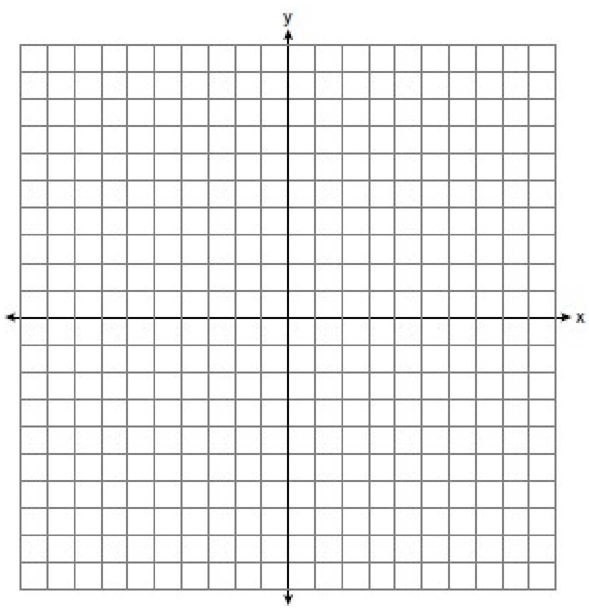
5. $A(2,1)$, $B(3,3)$, $C(7,1)$



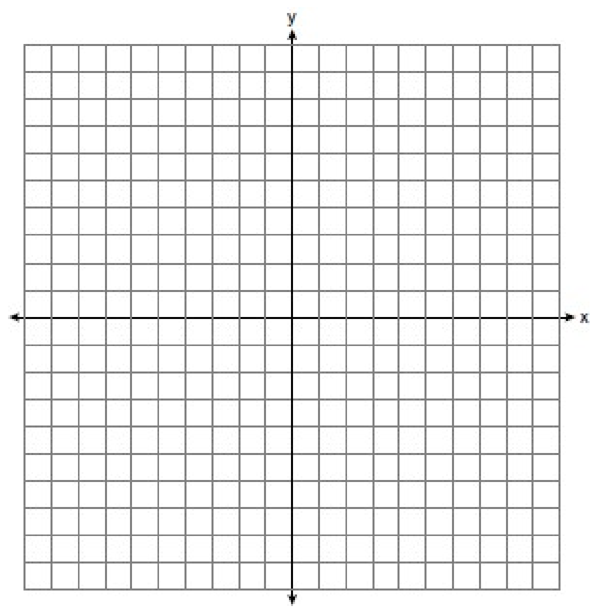
6. $A(-2,4)$, $B(1,6)$, $C(5,0)$



7. $A(-2,-4)$, $B(3,0)$, $C(7,-5)$



8. $A(-4,2)$, $B(-1,3)$, $C(2,-6)$



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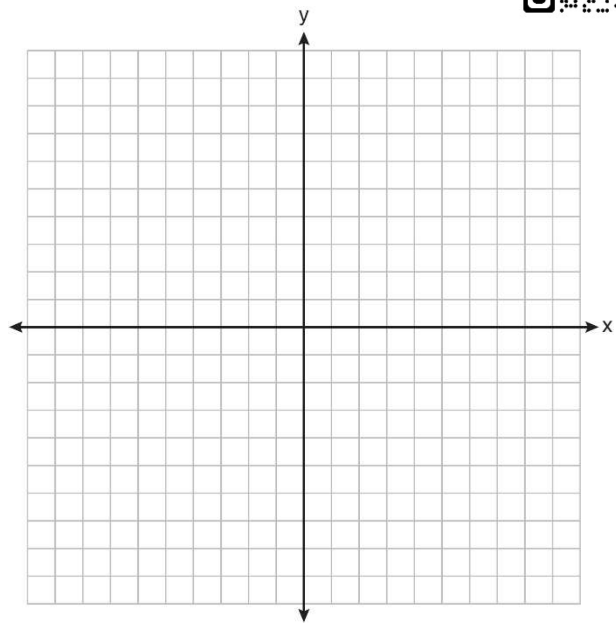
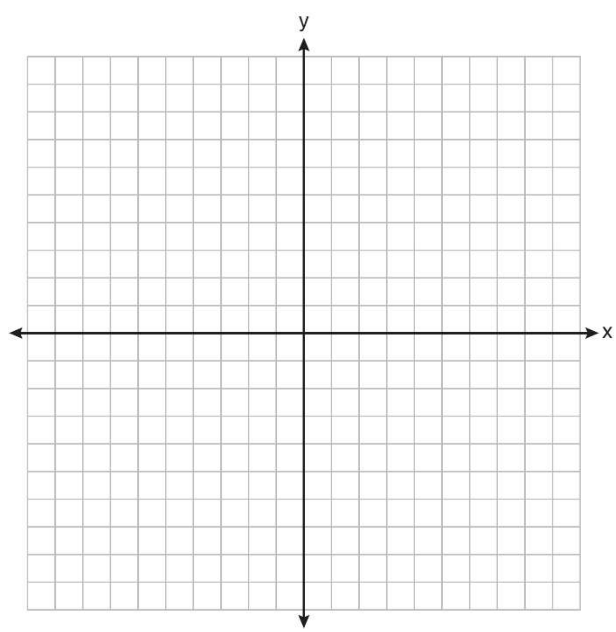
Coordinate Geometry Proofs Applications

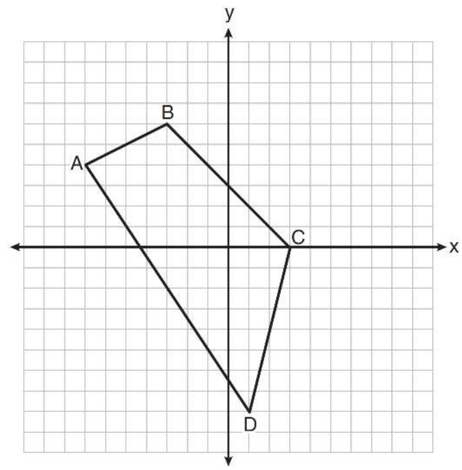
1. Given: $\triangle ABC$ with vertices $A(-6,-2)$, $B(2,8)$, and $C(6,-2)$. $\overline{AB}$ has midpoint D, $\overline{BC}$ has midpoint E, and $\overline{AC}$ has midpoint F.
Prove: *ADEF* is a parallelogram
ADEF is *not* a rhombus
[The use of the grid is optional.]



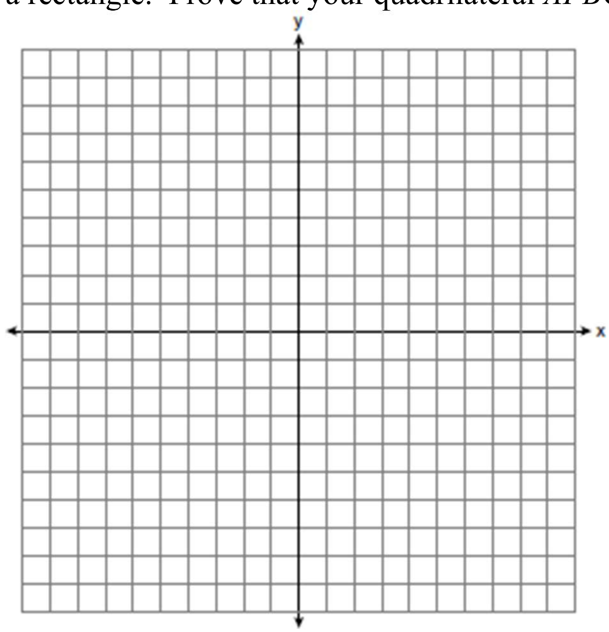
2. The vertices of rectangle *NRQW* are N(-2,5), R(2,5), Q(2,-3), and W(-2,-3). If A is the midpoint $\overline{NR}$, B is the midpoint of $\overline{RQ}$, C is the midpoint of $\overline{QW}$, and D is the midpoint of $\overline{WN}$, prove that *ABCD* is a rhombus.



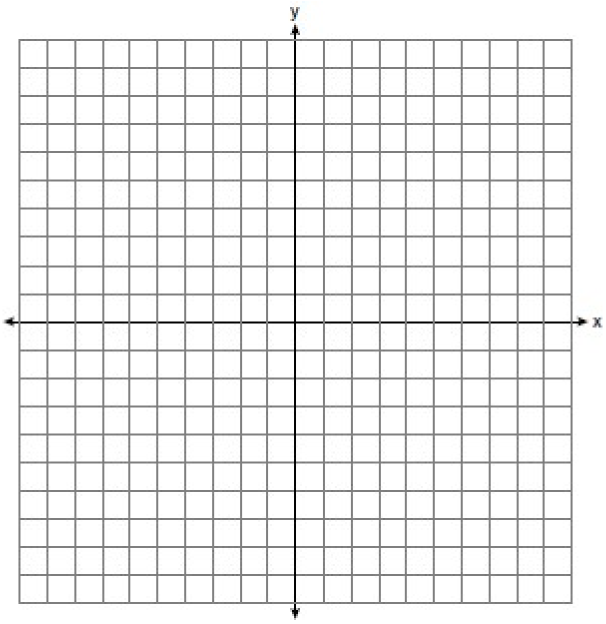
3. Quadrilateral *ABCD* with vertices $A(-7,4)$, $B(-3,6)$, $C(3,0)$, and $D(1,-8)$ is graphed on the set of axes below. Quadrilateral *MNPQ* is formed by joining *M*, *N*, *P*, and *Q*, the midpoints of $\overline{AB}$, $\overline{BC}$, $\overline{CD}$, and $\overline{AD}$, respectively. Prove that quadrilateral *MNPQ* is a parallelogram. Prove that quadrilateral *MNPQ* is *not* a rhombus.



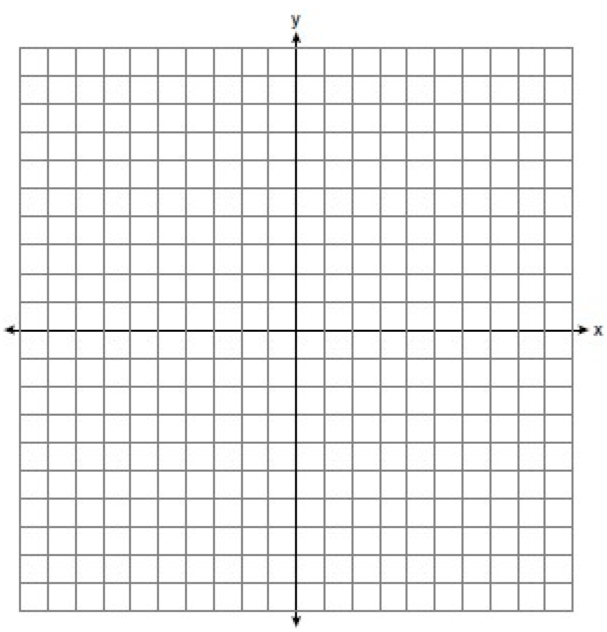
4. In the coordinate plane, the vertices of Triangle *ABC* are A(0,10) B(5,0) and C(8,4). Prove that Triangle *ABC* is a right triangle. State the coordinates of point *P* such that quadrilateral *APBC* is a rectangle. Prove that your quadrilateral *APBC* is a rectangle.



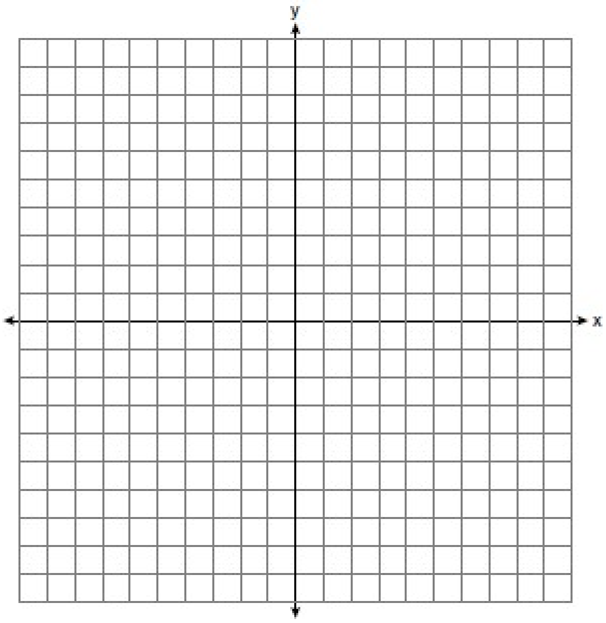
5. In the coordinate plane, the vertices of ΔRST are $R(6,-1)$, $S(1,-4)$, and $T(-5,6)$. Prove that ΔRST is a right triangle. State the coordinates of point *P* such that quadrilateral *RSTP* is a rectangle. Prove that your quadrilateral *RSTP* is a rectangle. [The use of the set of axes below is optional.]



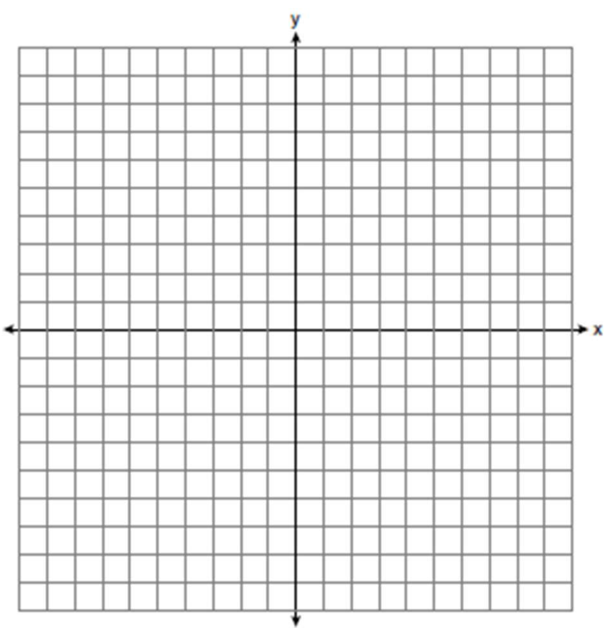
6. In the coordinate plane, the vertices of triangle *PAT* are $P(-1,-6)$, $A(-4,5)$, and $T(5,-2)$. Prove that $\triangle PAT$ is an isosceles triangle. [The use of the set of axes below is optional.] State the coordinates of *R* so that quadrilateral *PART* is a parallelogram. Prove that quadrilateral *PART* is a parallelogram.



7. Given: Triangle *DUC* with coordinates $D(-3,-1)$, $U(-1,8)$, and $C(8,6)$
Prove: $\triangle DUC$ is a right triangle
Point *U* is reflected over $\overline{DC}$ to locate its image point, *U'*, forming quadrilateral *DUCU'*.
Prove quadrilateral *DUCU'* is a square.
[The use of the set of axes below is optional.]



8. Triangle *PET* has vertices with coordinates $P(-6,4)$, $E(6,8)$, and $T(-4,-2)$. Prove $\triangle PET$ is a right triangle. State the coordinates of *N*, the image of *P*, after a 180° rotation centered at $(1,3)$. Prove *PENT* is a rectangle. [The use of the set of axes below is optional.]



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Reducing Radicals

Perfect Squares

1

4

9

16

25

36

49

64

81

100

1. $\sqrt{45}$
2. $\sqrt{50}$
3. $\sqrt{162}$
4. $\sqrt{32}$
5. $\sqrt{48}$
6. $\sqrt{75}$
7. $\sqrt{48}$
8. $\sqrt{200}$
9. $\sqrt{98}$
10. $\sqrt{125}$
11. $\sqrt{147}$
12. $\sqrt{192}$

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Adding Radicals

Express each of the following in simplest radical form

Perfect Squares

1

4

9

16

25

36

49

64

81

100

1. $\sqrt{50} + \sqrt{50}$

2. $\sqrt{32} + \sqrt{32}$

3. $\sqrt{63} + \sqrt{28}$

4. $\sqrt{45} + \sqrt{125}$

5. $3\sqrt{18} + 2\sqrt{72}$

6. $5\sqrt{27} + 2\sqrt{75}$

7. $2\sqrt{200}+2\sqrt{18}$

8. $4\sqrt{12}+3\sqrt{48}$

Perfect Squares

1

4

9

16

25

36

49

64

81

100

9. $4\sqrt{80}+2\sqrt{45}+12$

10. $4\sqrt{75}+8+3\sqrt{24}$

11. $3\sqrt{50}+2\sqrt{75}+4\sqrt{8}$

12. $2\sqrt{294}+3\sqrt{216}+2\sqrt{180}+6$

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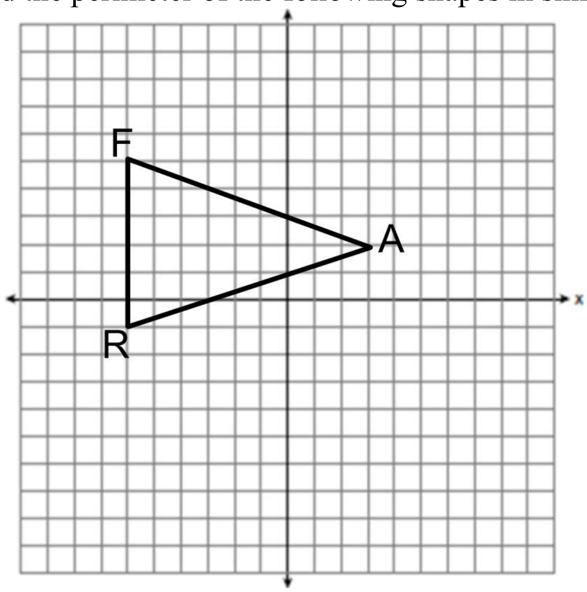
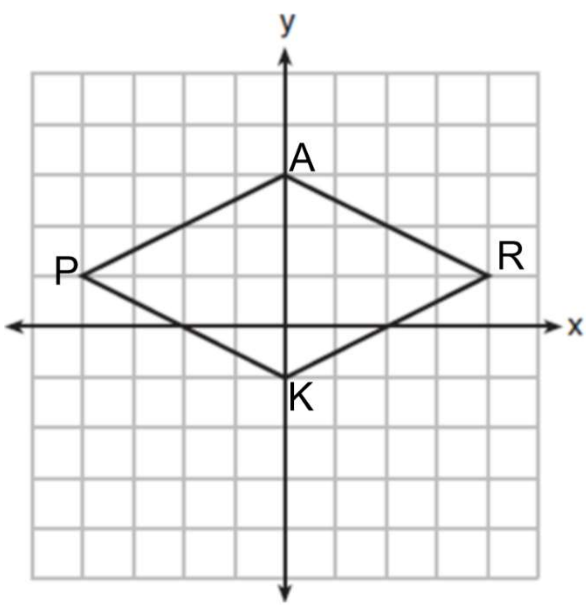
Finding Perimeter on the Grid

Find the perimeter of the following shapes in simplest radical form.

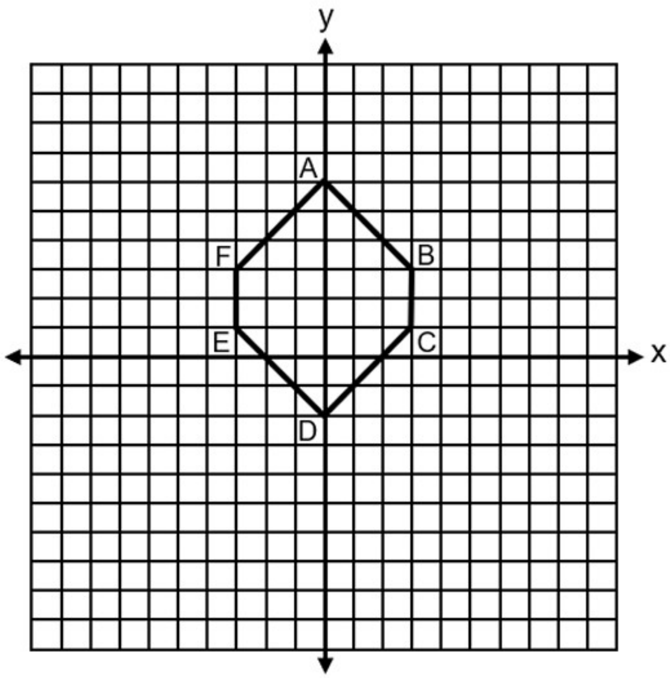
1.



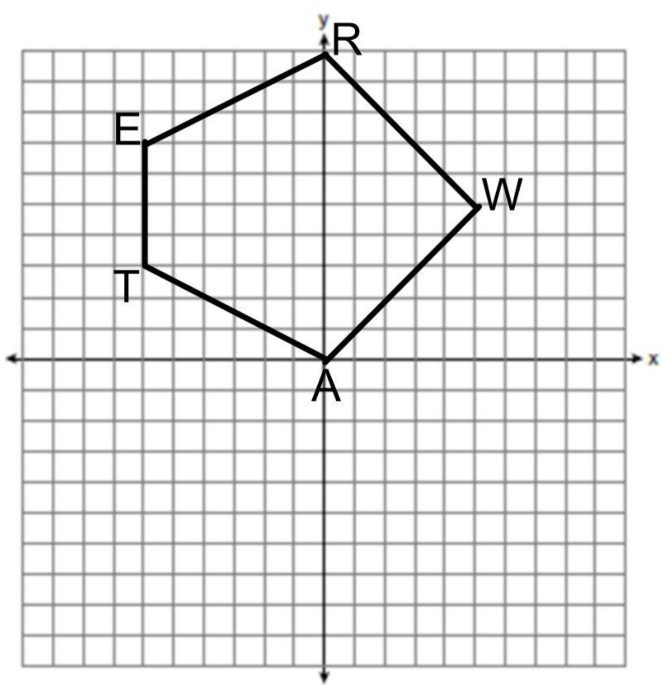
2.



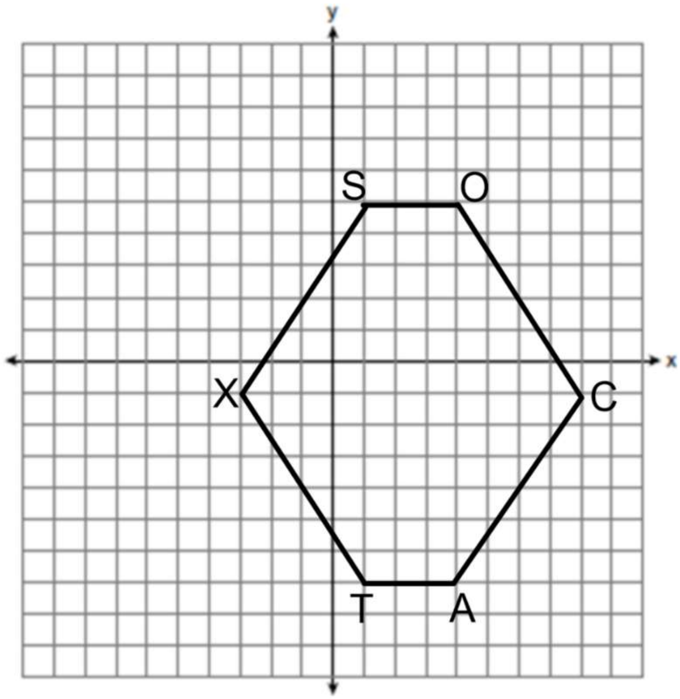
3.



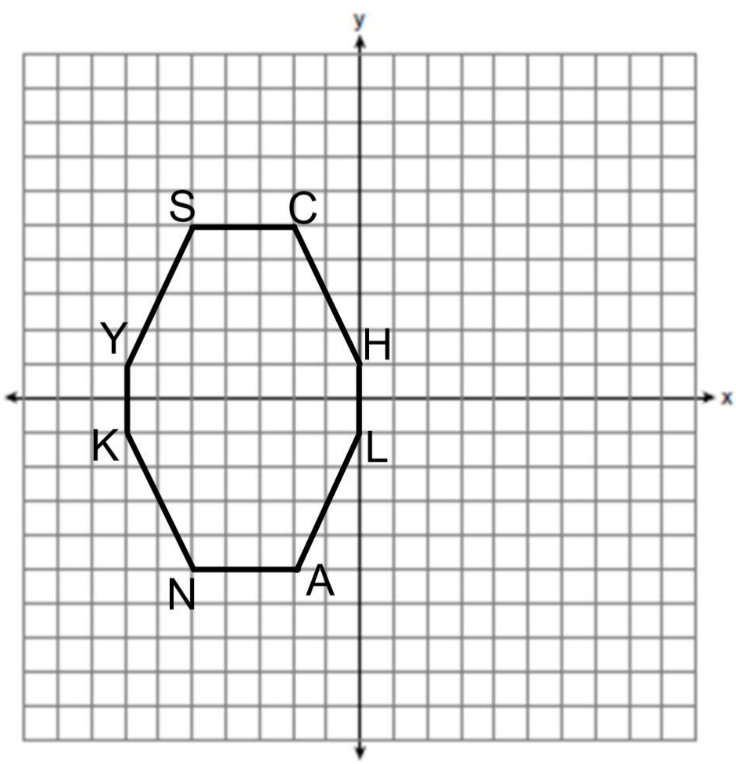
4.



5.



6.



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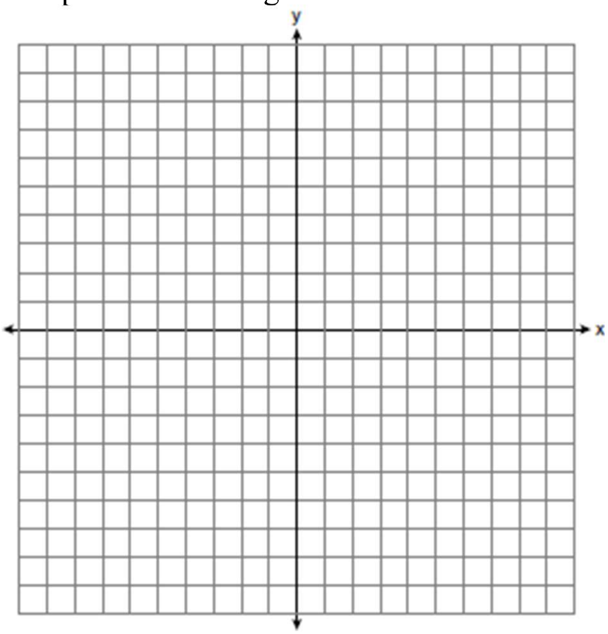
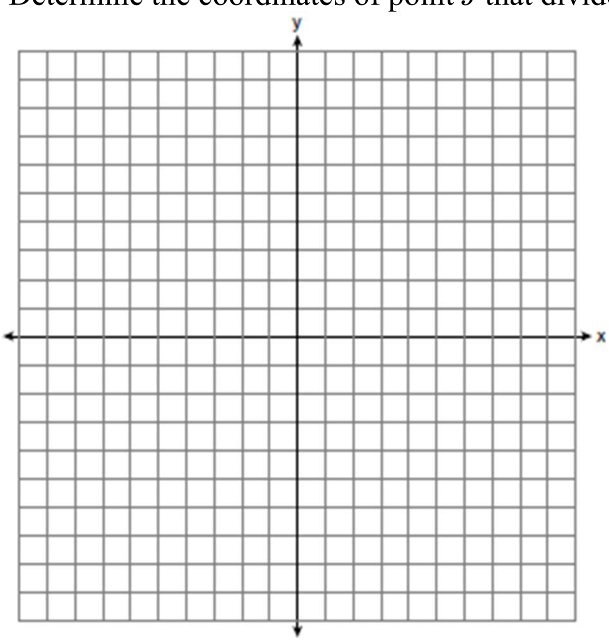
Coordinate Geometry Review Sheet

1. What are the coordinates of the point on the directed line segment from $M(-8,1)$ to $R(6,8)$ that partitions the segment into a ratio of 3 to 4?



2. Directed line segment TX has endpoints whose coordinates are $T(-6,8)$ and $X(9,-2)$. Determine the coordinates of point J that divides the segment in the ratio 2 to 3.



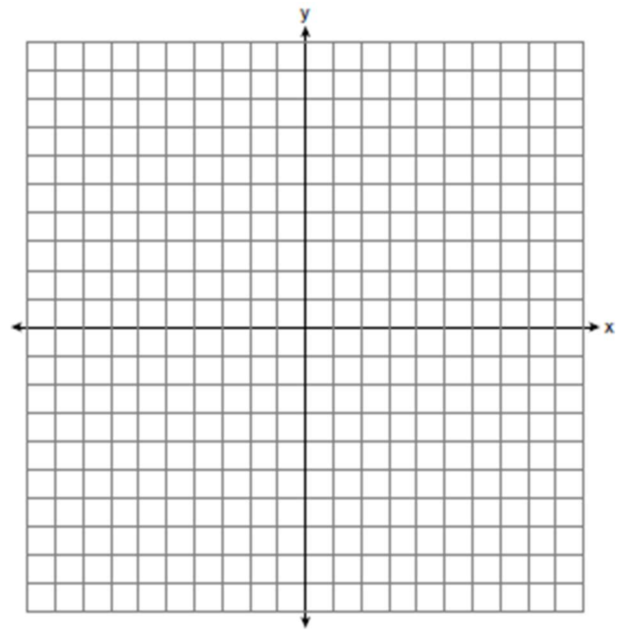
3. Write an equation of the perpendicular bisector of the line segment whose endpoints are (3,5) and (5,9).

1) $y+7=-\frac{1}{2}(x+4)$

2) $y+7=2(x+4)$

3) $y-7=-\frac{1}{2}(x-4)$

4) $y-7=2(x-4)$



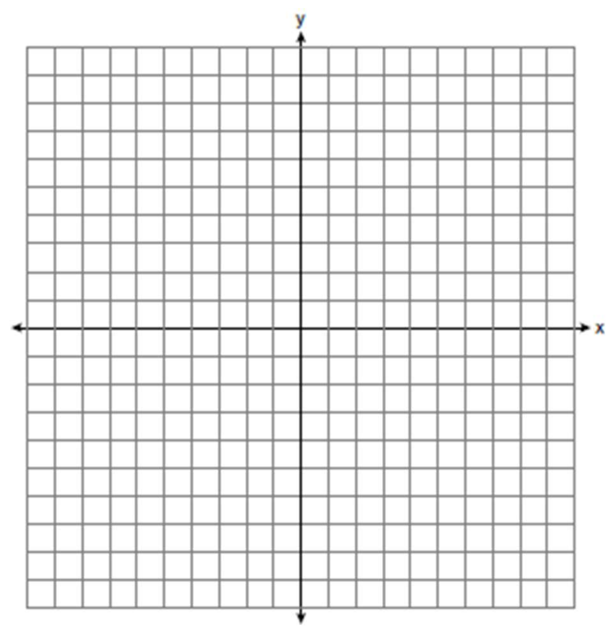
4. Write an equation of the perpendicular bisector of the line segment whose endpoints are (-1,5) and (1,1).

1) $y-3=\frac{1}{2}x$

2) $y+3=\frac{1}{2}x$

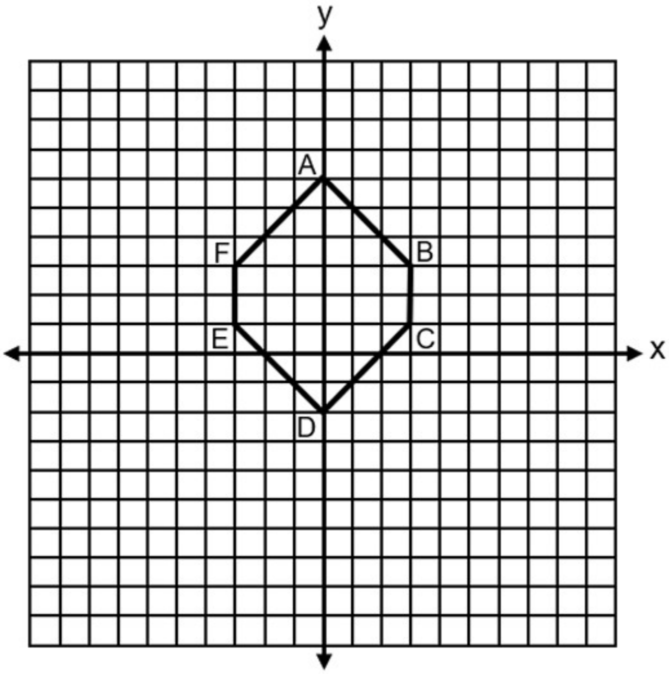
3) $y-3=-2x$

4) $y+3=-2x$

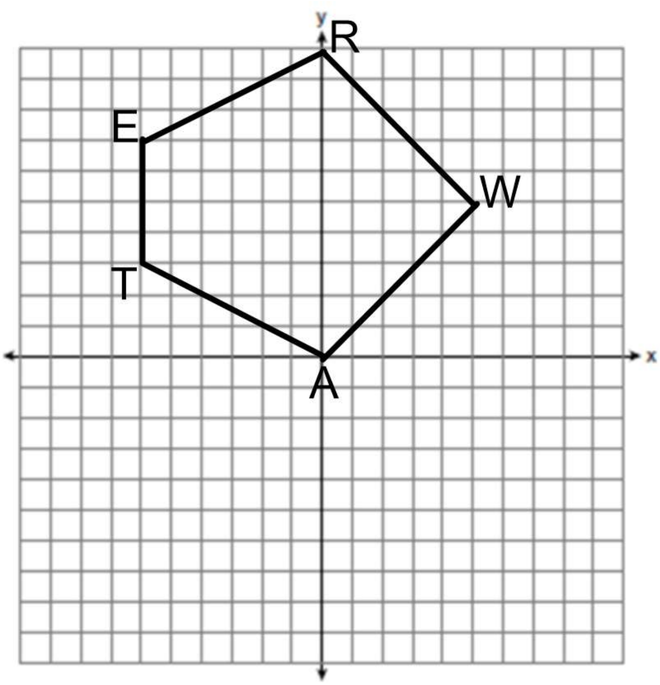


Find the perimeter of the following shapes in simplest radical form:

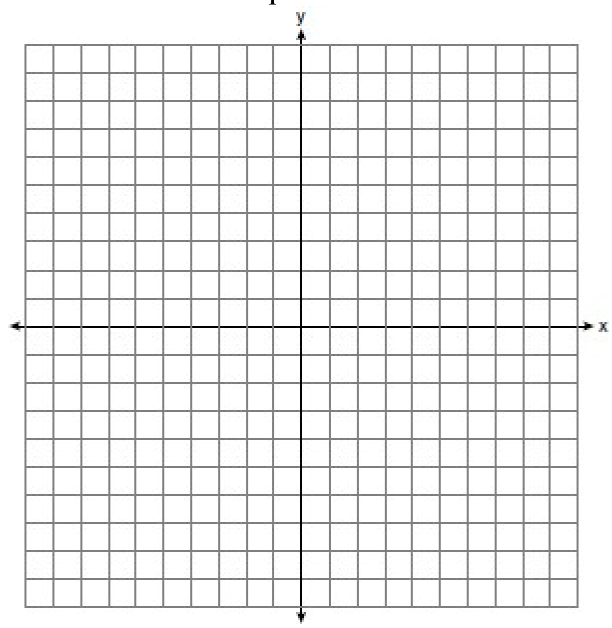
5.



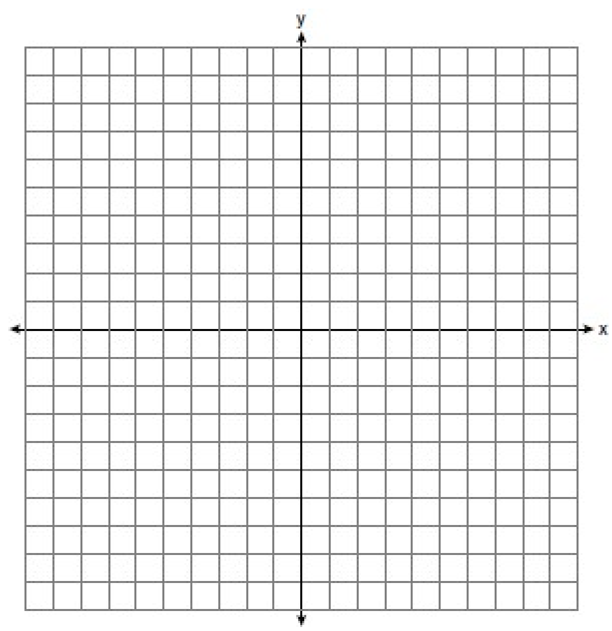
6.



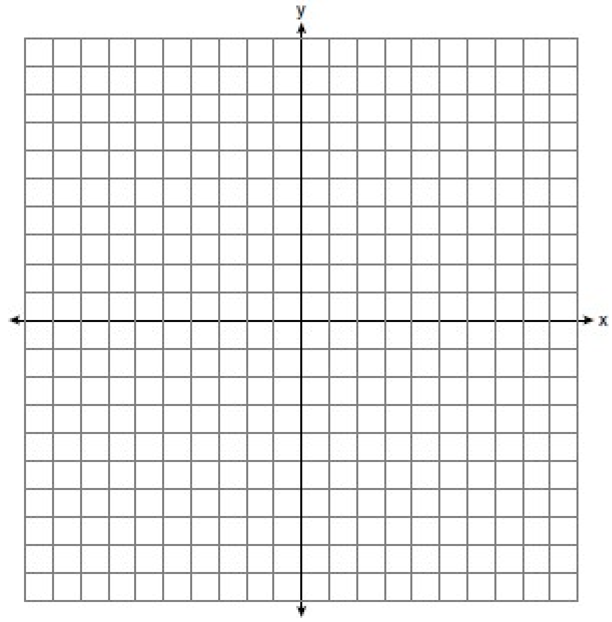
7. Given $C(-7,-3)$, $A(-7,2)$, $M(-1,5)$, $I(3,2)$. Prove *CAMI* is an isosceles trapezoid.



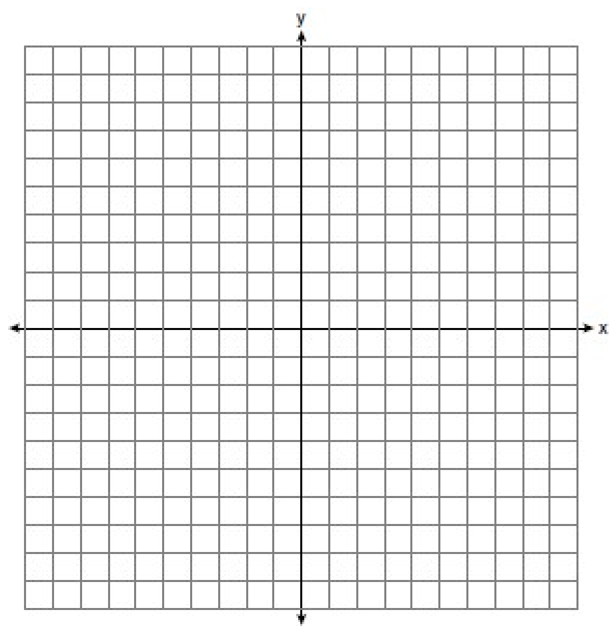
8. Given $M(-5,7)$, $I(-1,10)$, $L(9,5)$, $O(-3,-4)$. Prove *MILO* is an isosceles trapezoid.



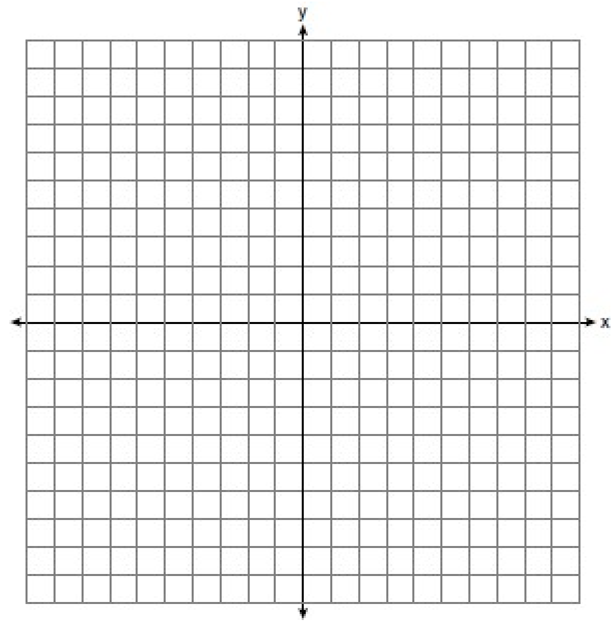
9. Triangle JOY has vertices J(4,0), O(5,4) and Y(1,5). Prove that JOY is an isosceles right triangle.



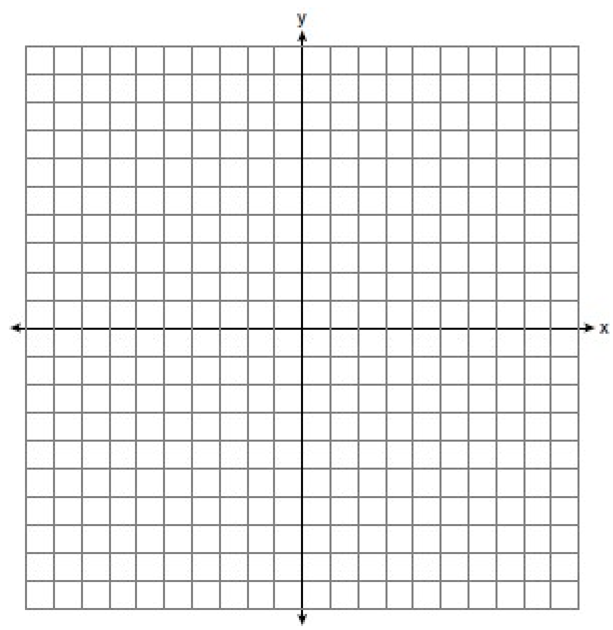
10. Triangle USA has vertices U(4,-7), S(-3,-4), and A(7,0). Prove that triangle USA is an isosceles right triangle.



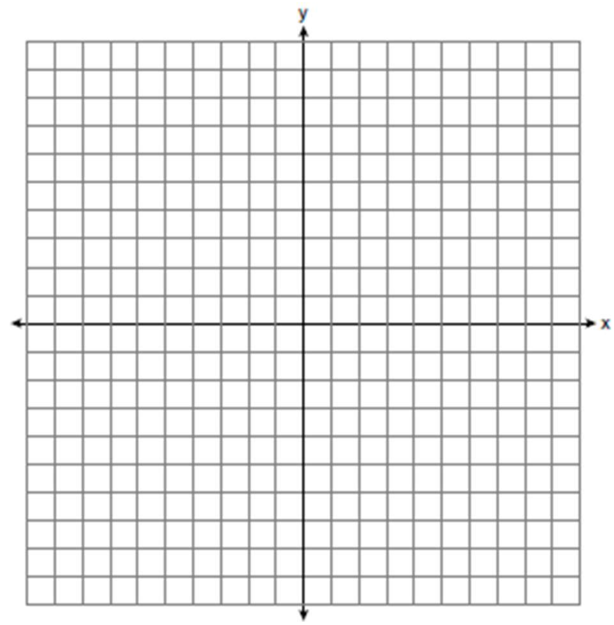
11. Quadrilateral *PQRS* has vertices $P(-2,3)$, $Q(3,8)$, $R(4,1)$, and $S(-1,-4)$. Prove that *PQRS* is a rhombus. Prove that *PQRS* is *not* a square.



12. Quadrilateral *TOBY* has vertices T(-4, -8), O(5,-1), B(8,10) and Y(-1,3). Using coordinate geometry, prove that quadrilateral *TOBY* is a rhombus but not a square.



13. Triangle *PET* has vertices with coordinates $P(-6,4)$, $E(6,8)$, and $T(-4,-2)$. Prove $\triangle PET$ is a right triangle. State the coordinates of *N*, the image of *P*, after a 180° rotation centered at $(1,3)$. Prove *PENT* is a rectangle. [The use of the set of axes below is optional.]



14. In the coordinate plane, the vertices of ΔRST are $R(6,-1)$, $S(1,-4)$, and $T(-5,6)$. Prove that ΔRST is a right triangle. State the coordinates of point *P* such that quadrilateral *RSTP* is a rectangle. Prove that your quadrilateral *RSTP* is a rectangle. [The use of the set of axes below is optional.]