Student 1

2.) The vertices of quadrilateral $ABCD$ are $A(-5,2), B(4,5), C(6,-1), D(-3,-4)$

Given the coordinates of the vertices of a quadrilateral, classify the quadrilateral as one of the following using the most specific classification possible:

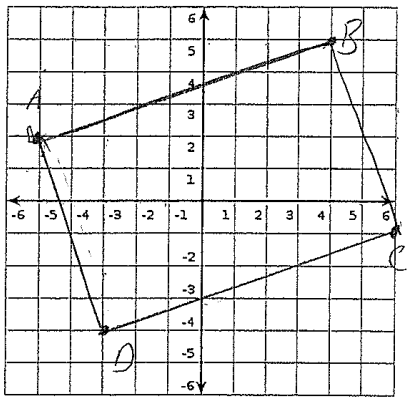
Parallelogram, Rectangle, Rhombus, Square, Trapezoid

Use slope $m = \frac{y_2 - y_1}{x_2 - x_1}$ and segment length $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ to help make your selection then write a mathematical argument to justify your classification.

Slope A-D (-3)
Slope B-C -3
Slope AB 1/3
Slope C-D 1/3

Length A-D $2\sqrt{10}$
length B-C $2\sqrt{10}$
Length A-B $2\sqrt{10}$
length C-D $2\sqrt{10}$

$\sqrt{(3-5)^2+(4-2)^2}$
$\sqrt{4+36}$
$\sqrt{(6-4)^2+(-1-5)^2}$
$\sqrt{4+36}$



The Shape is a square. Through mathematical calculations, all side lengths are $2\sqrt{10}$ and the slope of each line is its reciprical. Slope of A-D is -3 and Slope of C-D is 1/3. The side lengths are all equal and angles 90° due to slope. The characteristics of a square define this.

Student 2

2.) The vertices of quadrilateral $ABCD$ are $A(-5,2), B(4,5), C(6,-1), D(-3,-4)$

Given the coordinates of the vertices of a quadrilateral, classify the quadrilateral as one of the following using the most specific classification possible:

Parallelogram, Rectangle, Rhombus, Square, Trapezoid

Use slope $m = \frac{y_2 - y_1}{x_2 - x_1}$ and segment length $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ to help make your selection then write a mathematical argument to justify your classification.

$\sqrt{(4-(-5))^2 + (5-2)^2}$

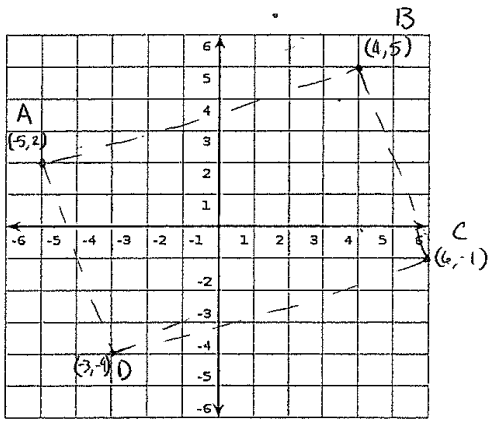
$9^2 + 3^2$

$81 + 9$

$\sqrt{90}$

$\overline{AB} \cong \overline{DC}$

$\overline{AD} \cong \overline{BC}$



$\sqrt{(6-(-3))^2 + (-1-(-4))^2}$

$9^2 + 3^2$

$81 + 9$

$\sqrt{90}$

$m = \frac{5-2}{4-(-5)} = \frac{3}{9} = \frac{1}{3}$ slope $AB \cong$ slope DC

$m = \frac{-1-(-4)}{6-(-3)} = \frac{3}{9} = \frac{1}{3}$

$\sqrt{(-3-(-5))^2 + (-4-2)^2}$

$2^2 + (-6^2)$

$4 + 36$

$\sqrt{40}$

$m = \frac{2-(-4)}{-5-(-3)} = \frac{6}{-2}$ slope $AD \cong$ slope BC

$m = \frac{5-(-1)}{4-6} = \frac{6}{-2}$

$\sqrt{(6-4)^2 + (-1-5)^2}$

$2^2 + (-6^2)$

$4 + 36$

$\sqrt{40}$

The shape is a rectangle

Student 3

2.) The vertices of quadrilateral $ABCD$ are $A(-5,2), B(4,5), C(6,-1), D(-3,-4)$

Given the coordinates of the vertices of a quadrilateral, classify the quadrilateral as one of the following using the most specific classification possible:

Parallelogram, Rectangle, Rhombus, Square, Trapezoid

Use slope $m = \frac{y_2 - y_1}{x_2 - x_1}$ and segment length $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ to help make your selection then write a mathematical argument to justify your classification.

$\overline{AB}$: $m = \frac{5-2}{4+5} = \frac{3}{9} = \frac{1}{3}$

$d = \sqrt{(4+5)^2 + (5-2)^2}$

$d = \sqrt{81+9}$

$d = \sqrt{90}$

$d = 3\sqrt{10}$

$\overline{DC}$: $m = \frac{-1+4}{6+3} = \frac{3}{9} = \frac{1}{3}$

$d = \sqrt{(9)^2 + (3)^2}$

$d = \sqrt{90}$

$d = 3\sqrt{10}$

$\overline{BC}$: $m = \frac{5+1}{4-6} = \frac{6}{2} = -3$

$d = \sqrt{(-2)^2 + (6)^2}$

$d = 2\sqrt{10}$

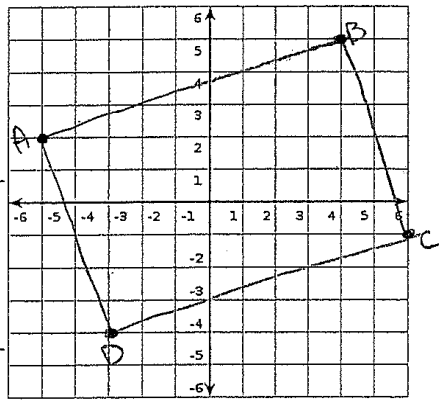
$\overline{AD}$: $m = \frac{2+4}{-5+3} = -\frac{6}{2} = -3$

$d = \sqrt{(-2)^2 + (6)^2}$

$d = \sqrt{4+36}$

$d = \sqrt{40}$

$d = 2\sqrt{10}$



This quadrilateral is a rectangle

By definition, a rectangle is a quadrilateral in which there are 2 sets of sides that are the same length and parallel and 4 right angles. There are 2 sets of sides that are parallel + the same length. $\overline{AB}$ is parallel to $\overline{CD}$ with the slope $\frac{1}{3}$, and both are the same length ($3\sqrt{10}$). $\overline{AD}$ is parallel to $\overline{BC}$ with the slope -3, and both of these lines are also the same length ($2\sqrt{10}$). I also know that this figure has all right angles because $\overline{AD}$ and $\overline{BC}$, with slopes of -3, are perpendicular to lines $\overline{AB}$ and $\overline{CD}$, with slopes of $\frac{1}{3}$. When lines are perpendicular, they create right angles. Based on all of this information, this quadrilateral can be proven to be a rectangle.

Student 4

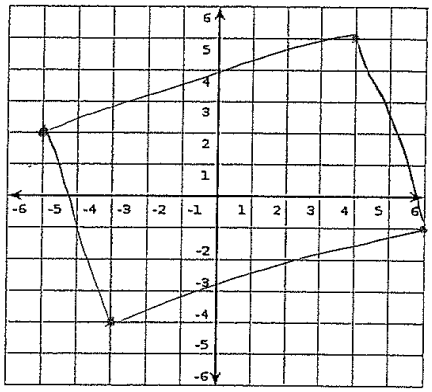
2.) The vertices of quadrilateral $ABCD$ are $A(-5,2), B(4,5), C(6,-1), D(-3,-4)$

Given the coordinates of the vertices of a quadrilateral, classify the quadrilateral as one of the following using the most specific classification possible:

Parallelogram, Rectangle, Rhombus, Square, Trapezoid

Use slope $m = \frac{y_2 - y_1}{x_2 - x_1}$ and segment length $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ to help make your selection then write a mathematical argument to justify your classification.

Obviously, just by graphing the vertices you can see that this quadrilateral is a rectangle.



It has two sets of parallel lines, four 90° angles, yet 2 sides lengths are longer than the other set.

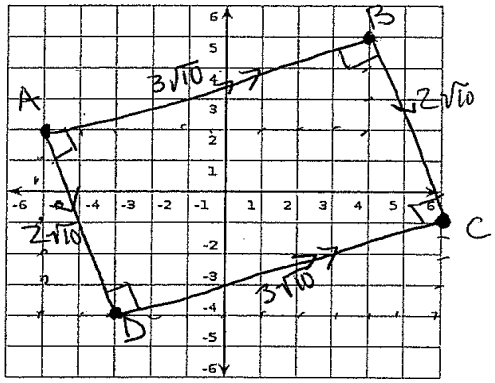
Student 5

) The vertices of quadrilateral $ABCD$ are $A(-5,2), B(4,5), C(6,-1), D(-3,-4)$

Given the coordinates of the vertices of a quadrilateral, classify the quadrilateral as one of the following using the most specific classification possible:

Parallelogram, Rectangle, Rhombus, Square, Trapezoid

se slope $m = \frac{y_2 - y_1}{x_2 - x_1}$ and segment length $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ to help make your selection then write nathematical argument to justify your classification.



slope $\overline{AB} = \frac{3}{9} = \frac{1}{3}$

slope $\overline{DC} = \frac{3}{9} = \frac{1}{3}$ $\therefore \overline{AB} \parallel \overline{DC}$

slope $\overline{AD} = \frac{-6}{2} = -3$

slope $\overline{BC} = \frac{-6}{2} = -3$ $\therefore \overline{AD} \parallel \overline{BC}$

$\therefore \angle A = 90^\circ$ $\overline{AB} \parallel \overline{DC}$

$\angle B = 90^\circ$ $\overline{AD} \parallel \overline{BC}$

$\angle C = 90^\circ$ $\overline{AB} \approx \overline{DC}$

$\angle D = 90^\circ$ $\overline{AD} \approx \overline{BC}$

$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$\overline{AB} = \sqrt{(4+5)^2 + (5-2)^2}$

$\overline{AB} = \sqrt{9^2 + 3^2}$

$\overline{AB} = \sqrt{81+9}$

$\overline{AB} = \sqrt{90}$

$\overline{AB} = 3\sqrt{10}$ $\therefore \overline{DC} = 3\sqrt{10}$

Rectangle:

using the slope formula, I found that $\overline{AB}$ and $\overline{DC}$ are parallell because the have the same slope. $\overline{AD} \parallel \overline{BC}$ as well because they have the same slope. The slopes are opposite and flipped over so all angles are 90°. However, since $\overline{BC} \not\approx \overline{AB}$ and $\overline{AD} \not\approx \overline{DC}$ all sides are not equal making it a rectangle

$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

~~$\overline{BC} = \sqrt{(6+1)^2 + (5-6)}$~~

$\overline{BC} = \sqrt{(6-9)^2 + (-1-5)^2}$

$\overline{BC} = \sqrt{2^2 + (-6)^2}$

$\overline{BC} = \sqrt{4+36}$

$\overline{BC} = \sqrt{40}$

$\overline{BC} = 2\sqrt{10}$ $\therefore \overline{AD} = 2\sqrt{10}$

Student 6

2.) The vertices of quadrilateral $ABCD$ are $A(-5,2), B(4,5), C(6,-1), D(-3,-4)$

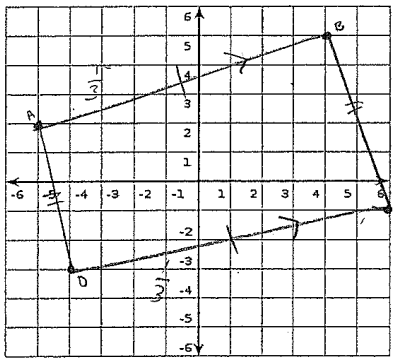
Given the coordinates of the vertices of a quadrilateral, classify the quadrilateral as one of the following using the most specific classification possible:

Parallelogram, Rectangle, Rhombus, Square, Trapezoid

Use slope $m = \frac{y_2 - y_1}{x_2 - x_1}$ and segment length $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ to help make your selection then write a mathematical argument to justify your classification.

$\frac{5-2}{4+5}$ $\frac{3}{9}$ $\frac{1}{3}$

$\frac{-4+1}{-3-6}$ $\frac{-3}{-9}$ $\frac{1}{3}$



$\frac{-4-2}{-3+5}$ $\frac{-6}{2}$ -3

$\frac{-1-5}{6-4}$ $\frac{-6}{2}$ -3

the shape is a parallelogram because its opposite sides are both congruent & parallel. I found this using distance formula to find the length of the segment & the slope formula to see if they were parallel.

$\sqrt{(-5+4)^2 + (2-5)^2}$

$\sqrt{(-9)^2 + (-3)^2}$

$\sqrt{81+9}$

$\sqrt{90}$

9.49

$\sqrt{(-5+3)^2 + (2+4)^2}$

$\sqrt{(-2)^2 + (6)^2}$

$\sqrt{4+36}$

$\sqrt{40}$

6.32

$\sqrt{(4-6)^2 + (5+1)^2}$

$\sqrt{(-2)^2 + (6)^2}$

$\sqrt{4+36}$

$\sqrt{40}$

6.32

$\sqrt{(9)^2 + (3)^2}$

$\sqrt{81+9}$

$\sqrt{90}$

9.49

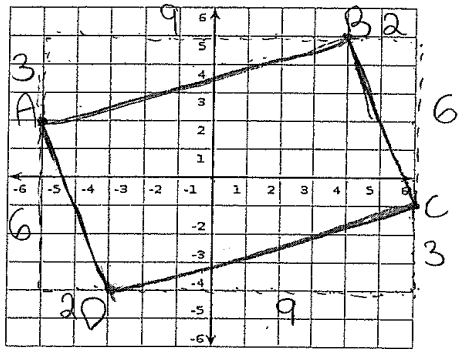
Student 7

2.) The vertices of quadrilateral $ABCD$ are $A(-5,2), B(4,5), C(6,-1), D(-3,-4)$

Given the coordinates of the vertices of a quadrilateral, classify the quadrilateral as one of the following using the most specific classification possible:

Parallelogram, Rectangle, Rhombus, Square, Trapezoid

Use slope $m = \frac{y_2 - y_1}{x_2 - x_1}$ and segment length $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ to help make your selection then write a mathematical argument to justify your classification.



$\frac{-1-5}{6-4} = \frac{-6}{2} = -3$

$\overline{AD}$ and $\overline{BC}$ have the same slope

$\frac{5-2}{4++5} \quad \frac{3}{9} = 1/3$

$\frac{-4+1}{-3-6} \quad \frac{-3}{-9} = 1/3$

$\overline{AB}$ and $\overline{DC}$ have the same slope

$9^2 + 3^2 = C^2$ 7811

$9^2 + 3^2 = C^2$

$6^2 + 2^2 = C^2$ 1600

$6^2 + 2^2 = C^2$

Using the pathagorem therom you can tell both are the same.

Student 8

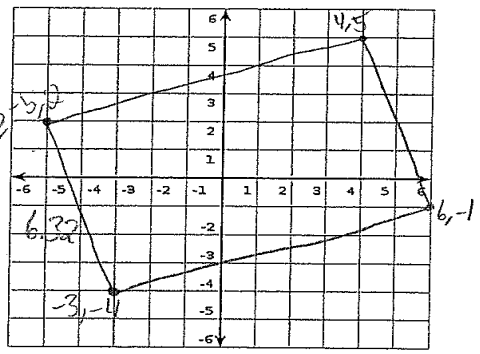
2.) The vertices of quadrilateral $ABCD$ are $A(-5,2), B(4,5), C(6,-1), D(-3,-4)$

Given the coordinates of the vertices of a quadrilateral, classify the quadrilateral as one of the following using the most specific classification possible:

Parallelogram, Rectangle, Rhombus, Square, Trapezoid

Use slope $m = \frac{y_2 - y_1}{x_2 - x_1}$ and segment length $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ to help make your selection then write a mathematical argument to justify your classification.

This shape is a rectangle, It has equal opposite sides, and congruent opposite slopes.



$d = \sqrt{(-4-2)^2 + (-3-5)^2}$

$d = \sqrt{(-6)^2 + (2)^2} = \sqrt{36+4} = \sqrt{40}$

$= 6.32$

$d = \sqrt{(4-6)^2 + (5--1)^2}$

$d = \sqrt{(-2)^2 + (-6)^2} = \sqrt{36+4} = \sqrt{40}$

$= 6.32$

$\frac{5-2}{4--5} = \frac{3}{9} = \frac{1}{3} = \text{slope}$

$\frac{-1--4}{6--3} = \frac{3}{9} = \frac{1}{3} = \text{slope}$ } = length

$\frac{-4-2}{-3--5} = \frac{-6}{2} = \frac{-3}{1} = \text{slope}$

$\frac{-1-5}{6-4} = \frac{-6}{2} = \frac{-3}{1} = \text{slope}$ } = width

Student 9

2.) The vertices of quadrilateral $ABCD$ are $A(-5,2), B(4,5), C(6,-1), D(-3,-4)$

Given the coordinates of the vertices of a quadrilateral, classify the quadrilateral as one of the following using the most specific classification possible:

Parallelogram, Rectangle, Rhombus, Square, Trapezoid

Use slope $m = \frac{y_2 - y_1}{x_2 - x_1}$ and segment length $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ to help make your selection then write a mathematical argument to justify your classification.

$(-3,-4)(6,-1)$

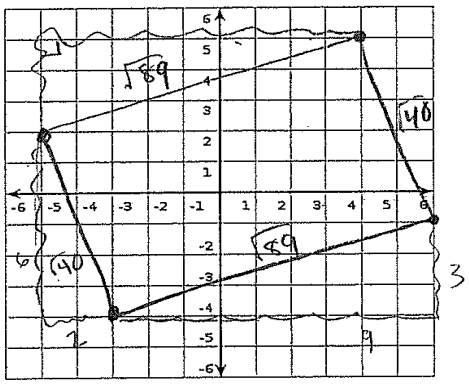
$m = \frac{6 - -3}{-1 - -4} \quad \frac{9}{3} = 3$

$m = (-5,2)(-4,-3)$

$\frac{-4 - -5}{-3 - 2} = \frac{1}{-5}$

$m = (4,5)(6,-1)$

$\frac{6-5}{-1-4} = \frac{1}{-5}$



$4 + 36 = \sqrt{40}$ $\quad 9 + 81 = \sqrt{89}$

This quadrilateral is a rectangle because there are 2 sets of congruent sides. The length is $\sqrt{89}$ and the width is $\sqrt{40}$. The slope of the length is 3 and the widths $-\frac{1}{5}$. The 2 sets of congruent sides (Length and width size difference) eliminates rhombus and square since all sides are equal for them. Trapezoid is eliminated because it has 2 acute and 2 obtuse angles which this quad. lacks. Between rectangle & parallelogram it is rectangle because it appears to lack obtuse and acute angles.

Student 10

2.) The vertices of quadrilateral $ABCD$ are $A(-5,2), B(4,5), C(6,-1), D(-3,-4)$

Given the coordinates of the vertices of a quadrilateral, classify the quadrilateral as one of the following using the most specific classification possible:

Parallelogram, Rectangle, Rhombus, Square, Trapezoid

Use slope $m = \frac{y_2 - y_1}{x_2 - x_1}$ and segment length $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ to help make your selection then write a mathematical argument to justify your classification.

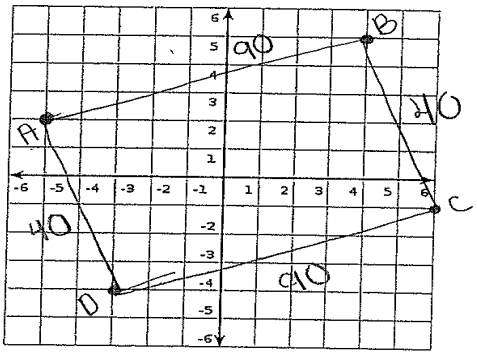
$\frac{-4+2}{-3+5} = \frac{-6}{2} = -3$

$\frac{5+2}{4+5} = \frac{3}{9} = 3$

$\frac{-1+5}{6+4} = \frac{-6}{2} = -3$

$\frac{-1+-4}{6+3} = \frac{3}{9} = 3$

AD = -3
AB = 3
BC = -3
DC = 3



$-3+5 = 2^2$ $\quad -4+2 = -6^2$

$4+36 = 40$ AD

$6+4 = 2^2$ $\quad -1+5 = -6^2$

$4+36 = 40$ BC

$4+5 = 9^2$ $\quad 5+2 = 3^2$

$81+9 = 90$ AB

$-3+6 = -9^2$ $\quad -4+1 = -3^2$

$81+9 = 90$ DC