January 31, 2020



Questions?

Today: Quadrilateral review Coordinate Geometry tools Homework: WS Special Right Triangles

Quadrilaterals

Review

Do you remember the definitions?

















Coordinate Geometry aka Analytic Geometry

First we need some tools



Find the slope of the line through the two points: A (-5, 2) and B (3, 7)



Find the distance between the two points A (-5, 2) and B (3, 7)

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Midpoint $A(x_1, y_1) B(x_2, y_2)$ Note: the midpoint is the point of bisection

midpoint =

Find the midpoint of the segment AB, A (-5, 2) and B (3, 7)

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Equations of lines through points $A(x_1, y_1) B(x_2, y_2)$

Slope-Intersect form:

Point-Slope form:

Find both forms of the equation of the line going through the points A (-5, 2) and B (3, 7)



A shape has these vertices: A(0, 0), B(3, 5), C(16, 5), D(13, 0)

Find the slopes of AB, BC, CD, DA

A shape has these vertices: A(0, 0), B(3, 5), C(16, 5), D(13, 0) Find the lengths of AB, BC, CD, DA

What shape is this? What shape is it **not**? Justify your answer using its definition.

In teams

You will get a quadrilateral to investigate.

Create a set of points that are the vertices of your quadrilateral.

Find the length and slope of the sides.

Are they congruent, parallel, perpendicular?

Create a poster of your quad showing how to identify it using coordinate geometry tools.



Find the lengths of the diagonals AC and BD

Using the same vertices: A(0, 0), B(3, 5), C(16, 5), D(13, 0)

Find the slopes of the diagonals AC and BD

Using the same vertices: A(0, 0), B(3, 5), C(16, 5), D(13, 0)

Find the midpoints of the diagonals AC and BD



```
Using the same vertices:
A(0, 0), B(3, 5), C(16, 5), D(13, 0)
Do the diagonal's properties uniquely define the
shape?
Could you use the diagonals to define the
seven types of quadrilateral?
```

A(0,0), B(3, 5) C(16, 5), D(13, 0)

Find the point-slope equations of the diagonals AC and BD

Are these lines perpendicular? Does the point (8, 2.5) satisfy both equations? What does that tell you?



Questions?

WorkSheet Kali Alex Cate

Start in class

Finish for homework

Turn in for HW credit


Skip thru to blue eyed dog

Shape SAGE

A shape has these vertices:

S(-2, 1), A(2, 4), G(6, 1), E(2, -5)

Show completely what shape it is and what shape it isn't using <u>sides.</u>





SA	Slope 3/4	Distance 5	Conclusion
AG	-3/4	5	
GE	6/4	√52	
ES	-6/4	√52	





Shape ALEX

A shape has these vertices:

A (2, -2√3), L (0,0), E (-8, 0), X (-6, -2√3)

Show completely what shape it is and what shape it isn't using diagonals.





ALEX: What shape is it and what shape isn't it?





Questions?



Find the point-slope equation of the line that goes through the points L(2, 5) and H(-4, -6)

Give the <u>slope-intercept</u> equation AND the <u>point-slope</u> equation of the line that goes through the points A(2, -7), C(-4, 7)

Give the <u>point-slope</u> equation AND the <u>slope-intercept</u> equation of the line that goes through the points D(-15,8), C(-14, -7)

Find the intersection of these two lines.

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y = 2x - 5
y - 5 = -\frac{1}{2}(x - 5)
```



Find the intersection of these three lines. Describe the shape created by their intersections.

$$y = 2$$

y - 2 = 2(x - 5)
y = -2x

These four lines intersect to make a shape. Find their intersection points.

Find out what shape it is and what shape it isn't.

$$y_1 = 4x + 2$$

 $y_2 - 6 = -\frac{1}{4}(x - 1)$
 $x = 7$
 $y_3 = -.25(x + 1) - 2$

The intersection of y_1 and y_2 make A The intersection of y_2 and x make B The intersection of x and y_3 make C The intersection of y_3 and y_1 make D

$$y_{1} = 4x + 2$$

$$y_{2} - 6 = -\frac{1}{4}(x - 1)$$

$$x = 7$$

$$y_{3} = -.25(x + 1) - 2$$









Questions?



Find the distance between G(-120, 548) and H(546, -920)

Give the point-slope equation of the line that goes through X(120, -657) and Y(3, 2)

```
Find the midpoint between J(99, 66) and K(-23, 8)
```

If P(-2,5) is one end of segment PR and Q(12, -15) is the midpoint of segment PR, find R.

Give the slope-intercept equation of the line that goes through E(123, 188) and F(250, 1025)

Given these diagonals, prove what this shape it is and what it isn't.

Diagonal 1 goes from (-7, 9) to (1,5)Diagonal 2 goes from (0,13) to (-7, -1) What shape is made by the intersection of these four lines? Remember to prove what it is and what it isn't.

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

$$y + 2 = -3(x - 9)$$

$$y = \frac{1}{3}x - 5$$

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

The line y = 4x - 2 is intersected by the two lines x = -5 and y = 7.

1. Find the points of intersection.

2. Find the point half way between the points of intersection.

Diagonal 1 goes from M(-5,3) to G(12,5) and diagonal 2 goes from A(-9,5) to S(-7,-12).

- 1. Are these diagonals \perp ?
- 2. Do these diagonals bisect?
- 3. Are these the diagonals of a trapezoid?

Does the line through N(-12, -84) A(45, 18) intersect the line through T(123, -7) E(66, -109)?

Homework.

Write a test question asking for the proof of what a shape is and what it isn't.

Give the coordinates of the four corner points.

Provide a complete solution.

Your well written, interesting question with clear solution may be used on the test.

We're done with coordinate geometry.

Test _____

You should be able to:

- Find distance, slope, and midpoint;
- Write two forms of the equation that goes through two points;
- Find the intersection of two lines.
- Use this data to prove what type of quadrilateral a shape is and what it isn't;

Next week Polygons

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