Quadrilaterals

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                          Quadrilaterals
         No pairs of                              2 pairs of
         parallel sides                           parallel sides
    Kite          1 pair of                       Parallelogram
                  parallel sides
                                          Rhombus        Rectangle
                  Trapezoid
                                                  Square
              Isosceles Trapezoid
```

Characteristics of Special Quadrilaterals

Parallelogram: both pairs of opposite sides are parallel

Rhombus: a Parallelogram with 4 $\cong$ sides

Rectangle: a Parallelogram with 4 right angles

Square: a Parallelogram with 4 $\cong$ sides and 4 right angles

Kite: a Quadrilateral with two pairs of adjacent sides that
        are congruent and no opposite sides congruent.

Trapezoid: a Quadrilateral with exactly one pair of
        parallel sides (bases)

Isosceles Trapezoid: a Trapezoid whose nonparallel sides
        are congruent (legs)

What is the best name for Quadrilateral ABCD?

A(15, -6)   B(24, 21)   C(-3, 30)   D(-12, 3)

$-12 + 13 \dfrac{-27}{-9}$

	Slope $\dfrac{y_2 - y_1}{x_2 - x_1}$	Distance $d = \sqrt{(x-x)^2 + (y-y)^2}$
AB	3	$d = \sqrt{810}$ $\sqrt{(24-15)^2}$
BC	$\dfrac{9}{-27} = \dfrac{-1}{3}$	$d = \sqrt{810}$ $81 + 729$
CD	+3	$d = \sqrt{810}$
DA	1/3	$d = \sqrt{810}$ Trap

What is the best name for Quadrilateral EFGH?

E(-24, 8)   F(8, 32)   G(36, 28)   H(-28, -20)

	Slope	Distance
EF	$\dfrac{3}{4}$	$d = \sqrt{(8+24)^2 + (32-8)^2}$ $\sqrt{1600}$ $\sqrt{1746}$
FG	$-1/7$	$d = \sqrt{(36-8)^2 + (28-32)^2}$ $\sqrt{800}$
GH	$\dfrac{-20-28}{-28-36} \dfrac{-48}{3/4}$	$d = \sqrt{(-28-36)}$ $\sqrt{1600}$
HE	$-1/7$	$\sqrt{800}$

Rect

Objective: Classifying special quadrilaterals
Use the graphic organizer that we filled out to answer the questions below.

Example 1: Judging by appearance, classify DEFG in as many ways as possible.

quad – 4 sides
rectangle
ll gram

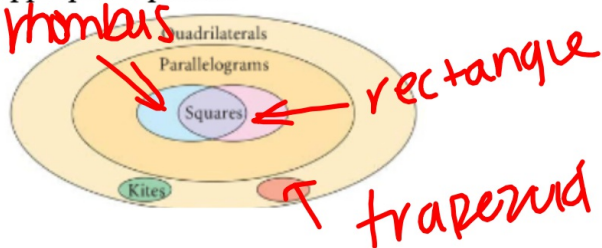QC 1: a) Judging by appearance, classify WXYZ in as many ways as possible.

rhombus
quad
ll gram

b) Which name gives the most information about WXYZ? Explain.

rhombus

Example 2: Add the labels *Rectangles*, *Rhombuses*, and *Trapezoids* to the Venn diagram in the appropriate places.

rhombus
Quadrilaterals
Parallelograms
Squares
Kites

rectangle

trapezoid

Recall from algebra that to find the slope of a line we can do:

(1) slope = $\dfrac{rise}{run}$

or

(2) slope = $\dfrac{y_2 - y_1}{x_2 - x_1}$
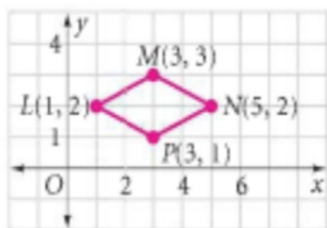
*Parallel lines have **same slope**

*Perpendicular lines (lines that meet at right angles) have **opp. rec. slopes.**

Example 2: Classifying by coordinate methods
Determine the most precise name for quadrilateral LMNP.

Step 1: Find the **slope** of each side using the

LM $\dfrac{1}{2}$

NP $\dfrac{1}{2}$

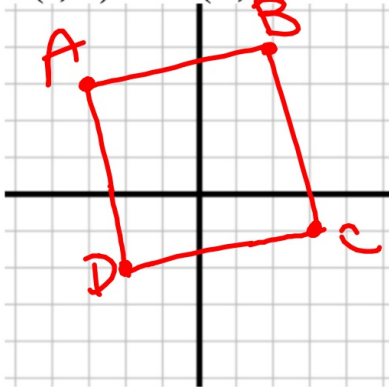MN $-\dfrac{1}{2}$

LP $-\dfrac{1}{2}$

Step 2: Find the __dist__ of each side using the

$$LM = \sqrt{5} \qquad MN = \sqrt{5}$$
$$NP = \sqrt{5} \qquad LP = \sqrt{5}$$
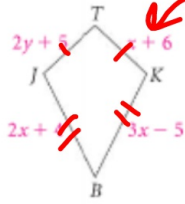
rhombus

QC 2: Determine the most precise name for quadrilateral ABCD with vertices A (-3, 3), B (2, 4), C (3, -1) and D (-2, -2).

Square

We can also use the definitions of special quadrilaterals to find the lengths of sides. If you know that sides are congruent, then __set sides = to each other__
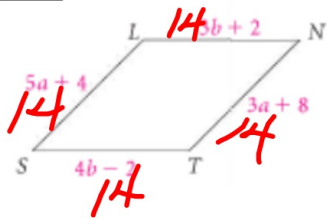
Example 3: Find the values of the variables for the kite.

$KB = JB$

$3x - 5 = 2x + 4$

$x = 9$

$TJ = TK$

$2y + 5 = 15$

$y = 5$

QC 3: Find the values of the variables for the rhombus. Then find the lengths of the sides.

$5a + 4 = 3a + 8$

$2a = 4$

$a = 2$

$3b + 2 = 4b - 2$

$2 = b - 2$

$b = 4$

Is each statement True or False?

1. All Rhombuses are Squares. *False*

2. Some Rectangles are Parallelograms. *False*

3. Every Square is a Rectangle. *True*

HW #1 - Semester I Reflection

HW #2 -

Sect. 6-1

Pages: 309-310

Problems: 7-12, 20, 24, 36-41

(both are due Thursday)