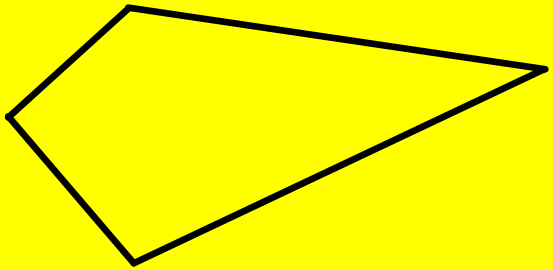
Geometry

Ch. 6 Handout 6.1

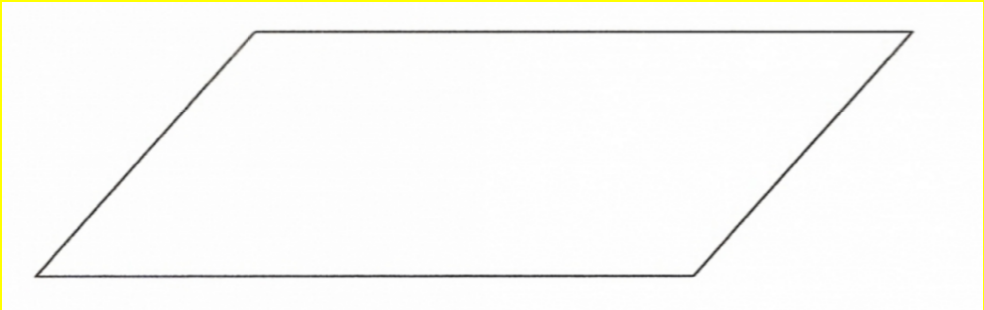
Classifying Quadrilaterals

Quadrilateral -- a four sided figure

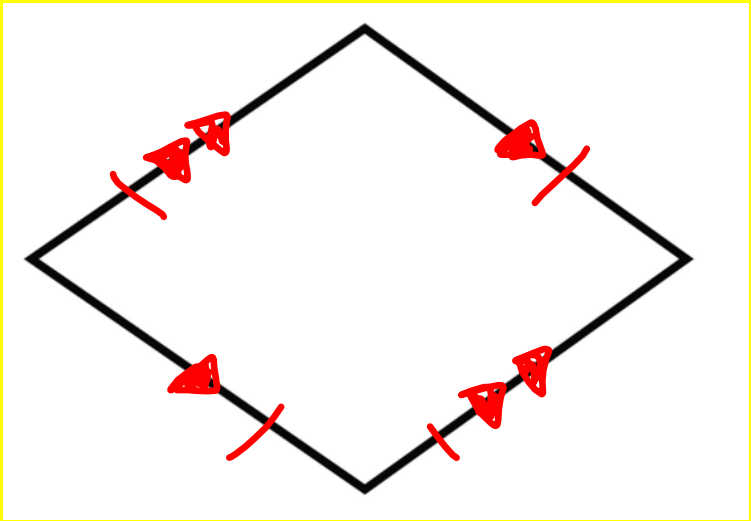


Special Quadrilaterals

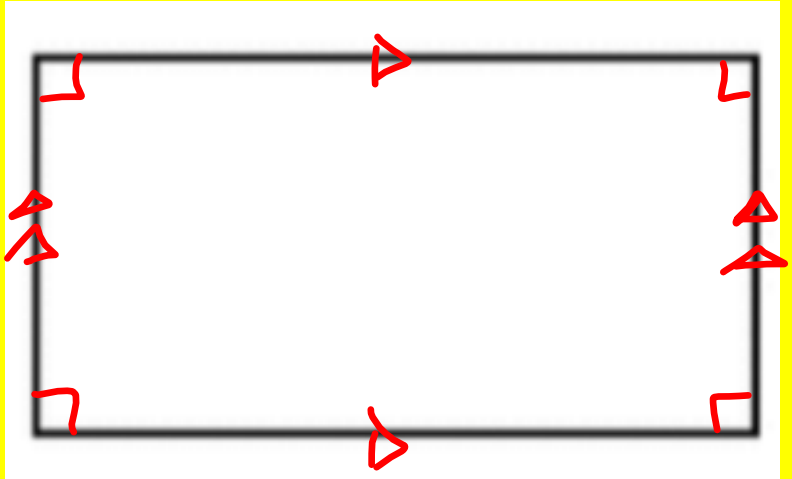
A **parallelogram** is a quadrilateral with both pairs of opposite sides parallel.



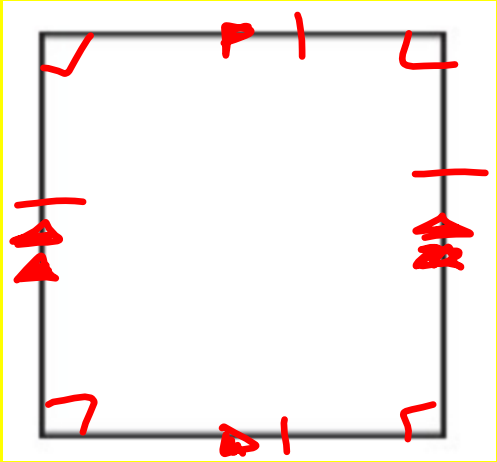
A **rhombus** is a parallelogram with four congruent sides.



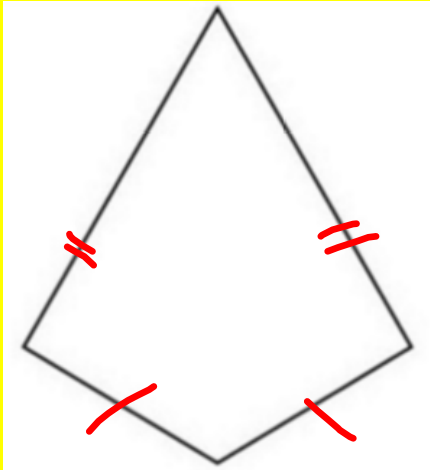
A **rectangle** is a parallelogram with four right angles.



A **square** is a parallelogram with four congruent sides and four right angles.



A **kite** is a quadrilateral with two pairs of adjacent sides congruent and no opposite sides congruent.



A **trapezoid** is a quadrilateral with exactly one pair of parallel sides. The **isosceles trapezoid** at the right is a trapezoid whose nonparallel opposite sides are congruent.

1. Classify by Coordinate Method: Determine the most precise name for the quadrilateral with vertices Q(-4, 4), B(-2, 9), H(8, 9), and A(10, 4). Graph quadrilateral QBHA.

Slope

m of BH = 0 *

m of HA = $-\frac{5}{2}$

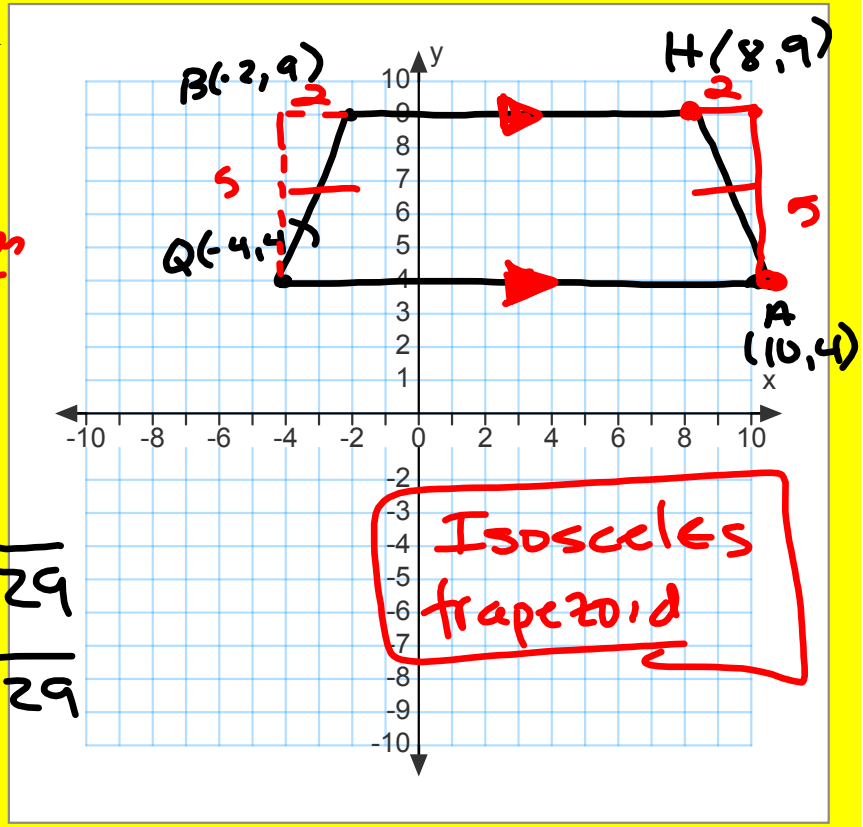
m of QA = 0 *

m of QB = $\frac{5}{2}$

Parallel lines m are equal

$QB = \sqrt{(-2-(-4))^2+(9-4)^2} = \sqrt{29}$

$AH = \sqrt{(8-10)^2+(9-4)^2} = \sqrt{29}$



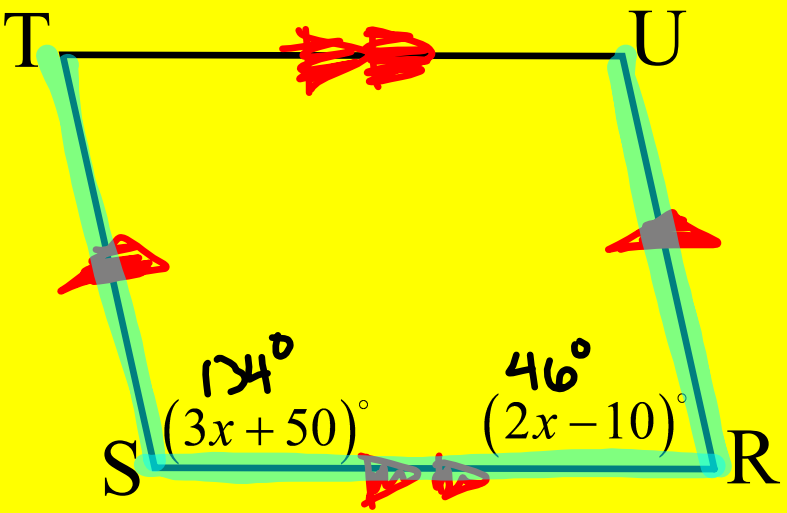
2. Using the properties of special quadrilaterals:
In parallelogram RSTU, $m\angle R = 2x - 10$ and $m\angle S = 3x + 50$.
Find x.

$3x + 50 + 2x - 10 = 180$

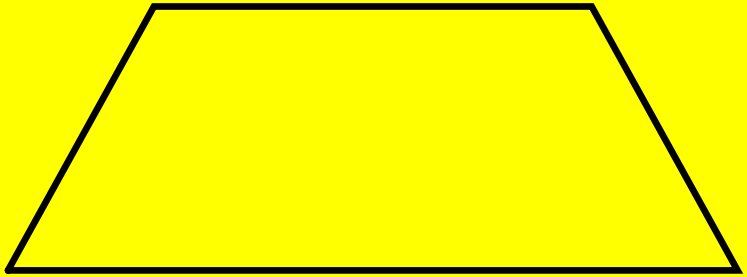
$5x + 40 = 180$

$5x = 140$

$x = 28$



3. Judging by appearance, classify ABCD in as many ways as possible.



Trapezoid

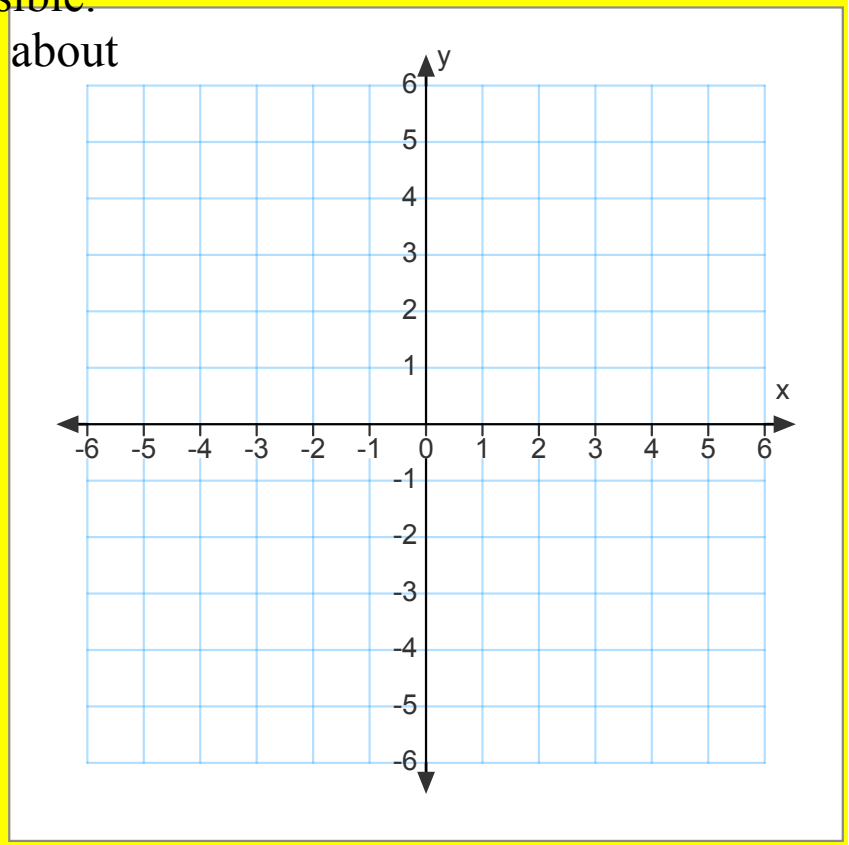
4. a) Graph quadrilateral ABCD with vertices A(-3, 3), B(2, 4), C(3, -1), and D(-2, -2).

b) Classify ABCD in as many ways as possible.

c) Which name gives the most information about ABCD? Explain.

B

C



5. Find the values of the variables in the rhombus. Then find the lengths of the sides.

$5a+4 = 3a+8$

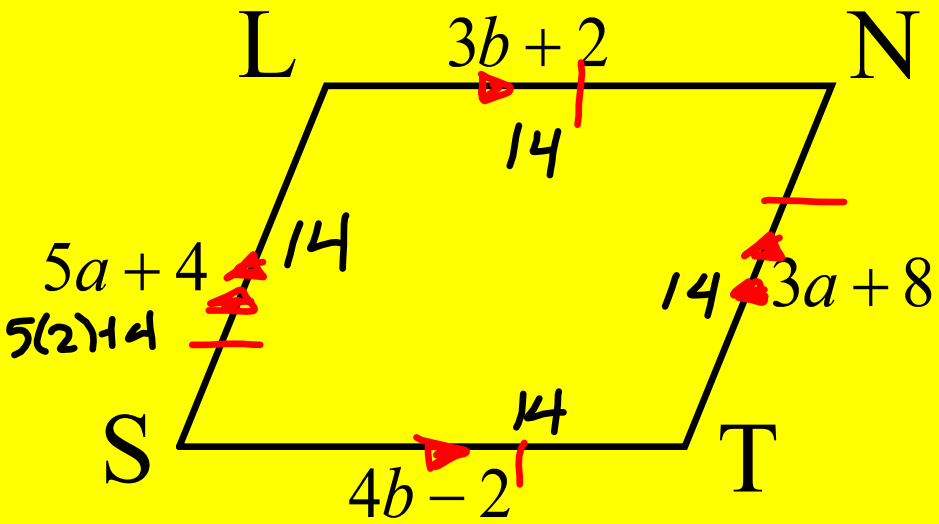
$-3a \quad -3a$

$2a+4 = 8$

$-4 \quad -4$

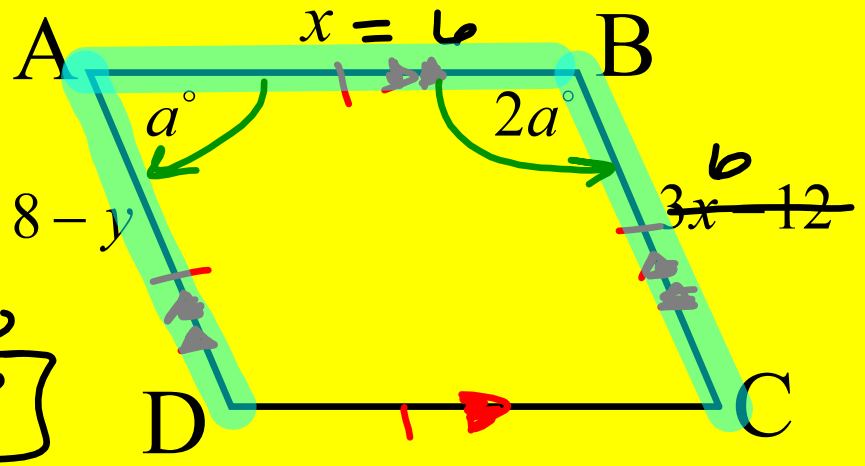
$2a = 4$

$a = 2$



6. Find the values of the variables in the rhombus below.

$x = 3x - 12$
$-3x \quad -3x$
$-2x = -12$
$x = 6$



$a + 2a = 180$
$3a = 180$
$a = 60^\circ$

$8 - y = 6$
$-y = -2$
$y = 2$

Assignment:

pgs 308-311 (1-14, 16, 19-26, 36-41)