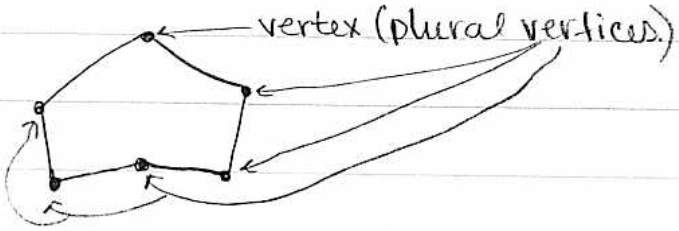
Geo 7
Polygons

polygon - closed geometric figure with at least three line segments for its sides.

sides - line segments that form a polygon.
vertex - point where two sides meet

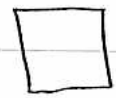
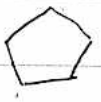
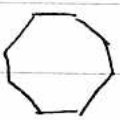
ex



regular polygon - polygon w/ sides of = length and angles of = measure.

We classify polygons by the # of sides they have

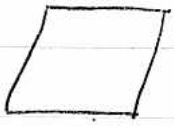
ex

	triangle	Quadrilateral	Pentagon	Hexagon	Heptagon	Octagon
Polygon						
Regular Polygon						

Note: the # of vertices is = # of sides
ex triangle has 3 sides & 3 vertices.

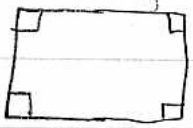
Quadrilaterals - figure w/ 4 sides

Parallelogram



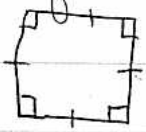
(opposite sides ||)

Rectangle



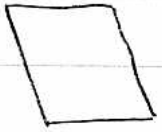
||ogram w/ 4 right angles

Square



Rectangle w/ = side lengths

Rhombus

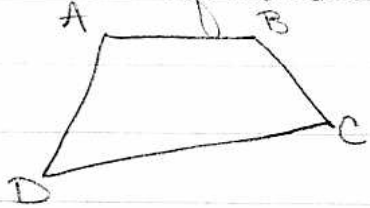


||ogram w/ = side lengths

Trapezoid

exactly 2 parallel sides

Name quadrilaterals same way.



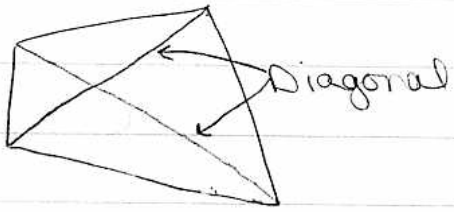
quadrilateral ABCD

note: must go in order; CANNOT call it quadrilateral ACBD

Always go clockwise or counterclockwise

Diagonal - line segment between two nonconsecutive vertices.

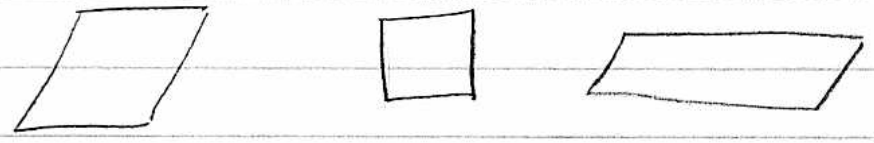
(ex)



Parallelogram

4 sides

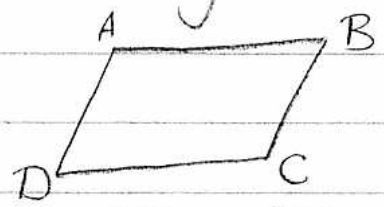
A quadrilateral whose opposite sides are parallel

(ex) 

Properties of Parallelograms

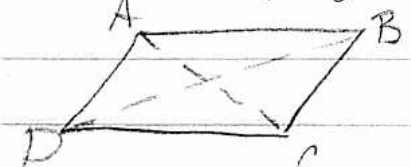
1. Opposite sides are parallel
2. " " Congruent (same length)
3. Opposite angles are congruent (same measure)
4. Diagonals hit at their midpoints
5. Diagonals split parallelogram into 2 congruent triangles.
6. Consecutive angles of a parallelogram are supplementary.

(ex) In $\square ABCD$



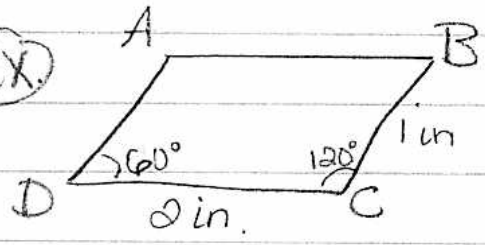
1. $\overline{AB} \parallel \overline{DC}$ and $\overline{AD} \parallel \overline{BC}$
2. $m(\overline{AB}) = m(\overline{DC})$ and $m(\overline{AD}) = m(\overline{BC})$
3. $m(\angle A) = m(\angle C)$ and $m(\angle D) = m(\angle B)$

6. $m(\angle A) + m(\angle D) = 180$ and $m(\angle D) + m(\angle C) = 180$ and $m(\angle C) + m(\angle B) = 180$ and $m(\angle B) + m(\angle A) = 180$



4. $\overline{AC}$ hits $\overline{BD}$ exactly at their middles
5. $\triangle ADB \cong \triangle CDB$ and

(ex)



then $m(\overline{AB}) = 2$ in

$m(\overline{AD}) = 1$ in.

$m(\angle B) = 60°$

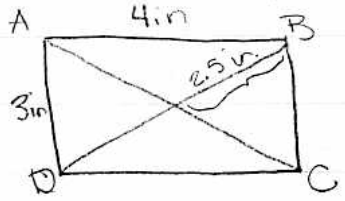
$m(\angle C) = 120°$

Properties of Rectangles

In any rectangle

1. All four angle are right angles
2. Opposite sides are ||
3. Opposite sides have = length.
4. Diagonals have = length
5. Diagonals meet at their midpts.

ex)



rectangle ABCD

Find $m(\overline{CD}) = 4$ in

$m(\overline{BC}) = 4$ in

$m(\overline{BD}) = 5$ in

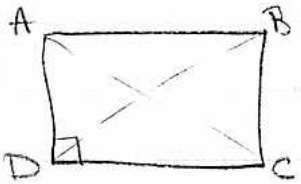
$m(\overline{AC}) = 5$ in

$m(\angle BAD) = 90°$

Parallelogram Theorems

1. If a llogram has one right ∠, then it's a rectangle.
2. If the diagonals of a llogram are ≅ then it's a rectangle

ex)



$\overline{AB} \parallel \overline{CD}$ $m(\overline{AC}) = 10$ and $m(\overline{BD}) = 10$

$\overline{AD} \parallel \overline{BC}$

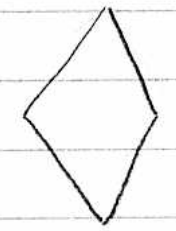
Since $m\angle D = 90°$ it's rectangle.

Since Diag. ≅ it's rectangle.

Rhombus

Rhombus - a parallelogram with two congruent adjacent sides.

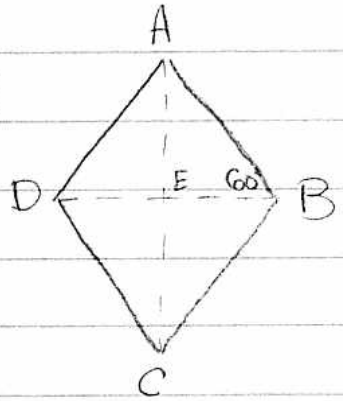
(ex)



Properties of Rhombus

1. opposite sides are parallel
2. " " congruent
3. Opposite angles are congruent.
4. Diagonals bisect each other (hit exactly in midd
5. " " split rhombus into 2 congruent △.
6. Consecutive angles are supplementary.
7. All sides are congruent.
8. Diagonals are perpendicular
9. " " bisect the angles

(ex)



find $m(\angle DBC) = 60°$

$m(\angle BCD) = 60°$

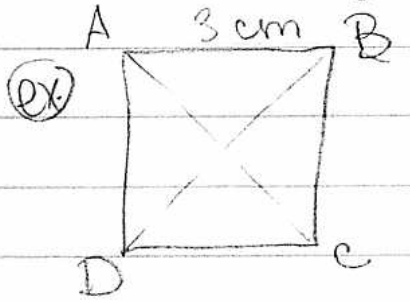
$m(\angle BCE) = 30°$

Squares

Square - a rectangle with two congruent adjacent sides

Properties

1. opposite sides are parallel
2. " "congruent
3.
4. Diagonals bisect each other.
5. " split square into 2 congruent △
6.
7. All angles are 90° (right)
8. Diagonals are congruent
9. All sides are congruent
10. Diagonals are perpendicular.
11. Diagonals bisect the angles



(ex)

$m(\overline{BC}) = 3 = m(\overline{CD}) = m(\overline{DA})$

$m(\angle ABC) = 90° = m(\angle BCD) = m(\angle CDA) = m(\angle$

$m(\angle ABD) = 45°$