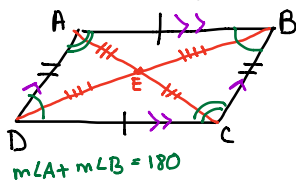


# Properties of Quadrilaterals

22

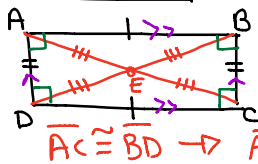
Quadrilateral: polygon with 4 sides

Parallelogram:



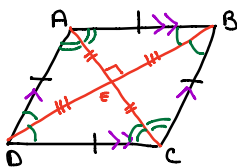
- 2 pairs of opposite sides are  $\parallel$
- 2 pairs of opposite sides are  $\cong$
- 1 pair of opposite sides  $\parallel$  &  $\cong$
- diagonals bisect each other
- opposite  $\sphericalangle$ s  $\cong$
- consecutive  $\sphericalangle$ s supplementary

Rectangle:



- All properties of a parallelogram
- diagonals  $\cong$
- has a right  $\sphericalangle$

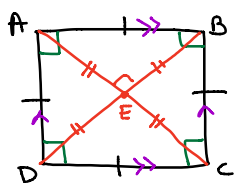
Rhombus:



$\angle DAC \cong \angle BAC \cong \angle DCA \cong \angle BCA$

- all the properties of a parallelogram
- diagonals  $\perp$  (perpendicular)
- diagonals bisect opp.  $\sphericalangle$ s
- all sides  $\cong$

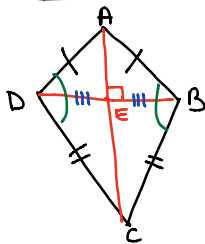
Square:



$\angle DAC \cong \angle BAC \cong \angle ABD \cong \angle CBD \dots = 45^\circ$

- all properties of parallelogram
- all properties of rectangle
- all properties of rhombus

Kite:

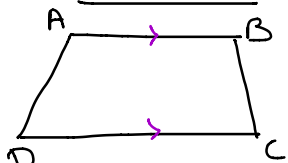


- 2 pairs of consecutive sides  $\cong$
- diagonals  $\perp$
- 1 pair of opp  $\sphericalangle$ s  $\cong$
- Short diagonal is bisected by long diagonal (from 2  $\cong$   $\sphericalangle$ s)

[rhombus is a kite ...]

a kite is sometimes a rhombus]

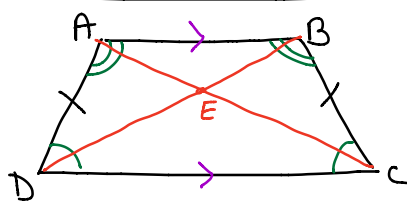
### Trapezoid:



$$m\angle A + m\angle D = 180 \quad ; \quad m\angle B + m\angle C = 180$$

- 1 pair of opp sides  $\parallel$
- 2 pair of consecutive  $\sphericalangle$ s supplementary

### Isosceles Trapezoid:



$$\overline{AC} \cong \overline{BD}$$

- all props of trapezoid
- diagonals  $\cong$
- non-parallel sides  $\cong$
- base  $\sphericalangle$ s  $\cong$

\* There is also right kite & right trapezoid

### Area formulas

Kite:  $A = \frac{1}{2}d_1 \cdot d_2$  ( $d_1, d_2 = \text{diagonals}$ )

Trapezoid:  $A = \frac{1}{2}h(b_1 + b_2)$

Parallelogram:  $A = bh$

rectangle:  $A = bh$  [or  $lw$ ]

Rhombus:  $A = \frac{1}{2}d_1 \cdot d_2$  ( $d_1, d_2 = \text{diagonals}$ )

Square:  $A = bh$  [or  $s^2$  or  $lw$ ]