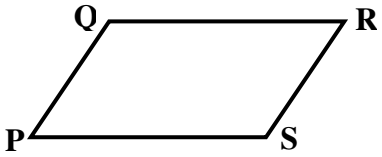
Geometry Note-Taking Guide **Name:**_____

Period:____

Section 8.2 – Properties of Parallelograms

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

The symbol used for a parallelogram is $\square$. In the diagram for $\square PQRS$, $\overline{PQ} \parallel \overline{RS}$ and $\overline{QR} \parallel \overline{SP}$.

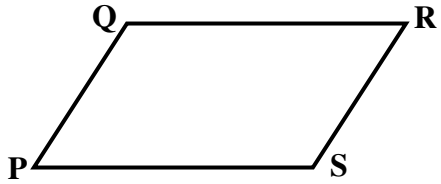


Note: Label Diagram

Properties of a Parallelogram

If a quadrilateral is a parallelogram, then its **opposite sides** are congruent.

$\overline{PQ} \cong \overline{RS}$ and $\overline{SP} \cong \overline{QR}$

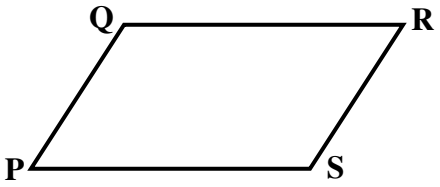


If a quadrilateral is a parallelogram, then its **opposite angles** are congruent.

$\angle P \cong \angle R$ and $\angle Q \cong \angle S$

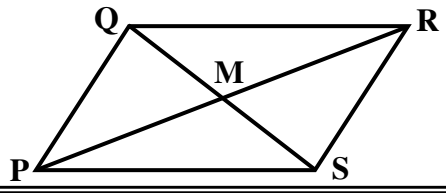
If a quadrilateral is a parallelogram, then its **consecutive angles** are supplementary.

$m\angle P + m\angle Q = 180°$, $m\angle Q + m\angle R = 180°$, $m\angle R + m\angle S = 180°$, $m\angle S + m\angle P = 180°$



If a quadrilateral is a parallelogram, then its **diagonals bisect** each other.

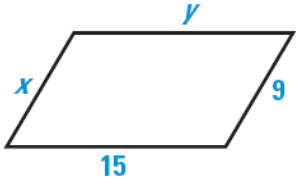
$\overline{QM} \cong \overline{SM}$ and $\overline{PM} \cong \overline{RM}$



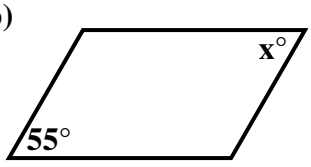
Ex 1:

Find the value of the variable(s) for the parallelogram.

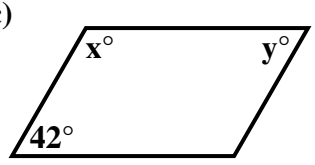
a)



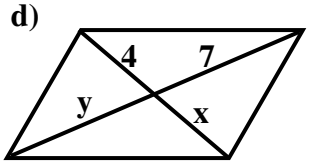
b)



c)

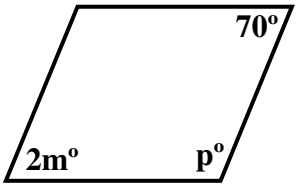


d)



Ex 2:
Find the value of each variable in the parallelogram.

a)



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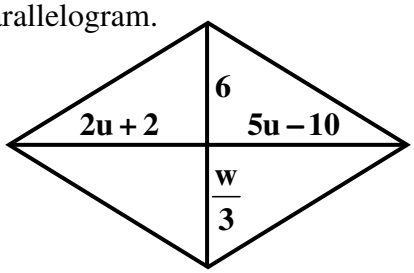
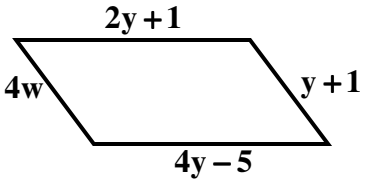


c)



Ex 3:
Find the measure in parallelogram ABCD.

a) DE =

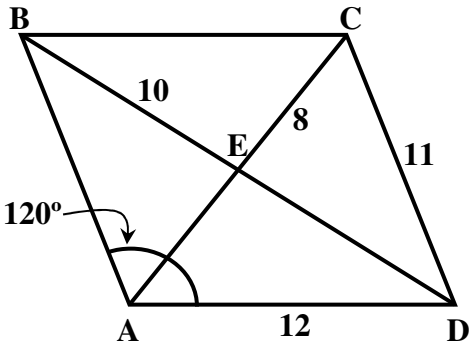
b) BC =

c) m∠ABC =

d) BA =

e) m∠DCB =

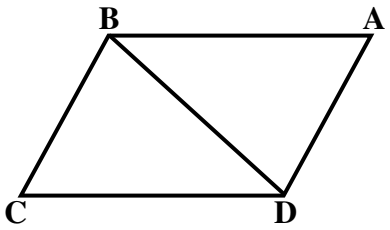
f) AC =



Ex 4:

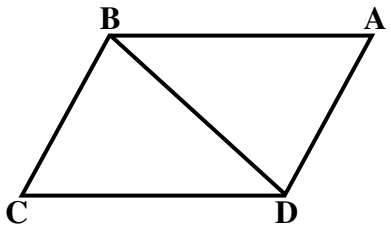
Given: ▱ABCD
Prove: ΔABD ≅ ΔCDB **Note:** There are many approaches to solving this proof.

Approach #1



Statement	Reason
1. ▱ABCD	**1.** Given
2. $\overline{BA} \cong \overline{CD}$	**2.** _____
3. ∠CDB ≅ ∠ABD	**3.** _____
4. $\overline{BD} \cong \overline{BD}$	**4.** _____
5. ΔABD ≅ ΔCDB	**5.** _____

Approach #2



Statement	Reason
1. ▱ABCD	**1.** Given
2. ∠C ≅ ∠A	**2.** _____
3. ∠CBD ≅ ∠ADB	**3.** _____
4. $\overline{BD} \cong \overline{BD}$	**4.** _____
5. ΔABD ≅ ΔCDB	**5.** _____