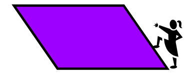
Answer Key

6.2: Properties of Parallelograms



Target: Use properties of parallelograms to solve algebraic problems.
Target: Use the properties of a parallelogram to write a two-column proof.

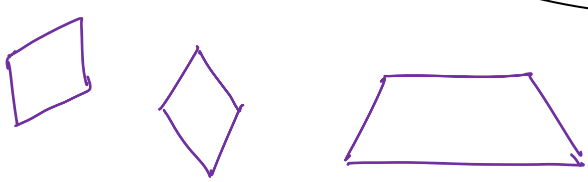
QUADRILATERALS

Characteristics
- made up of segments
- consecutive sides intersect at endpts.
- closed

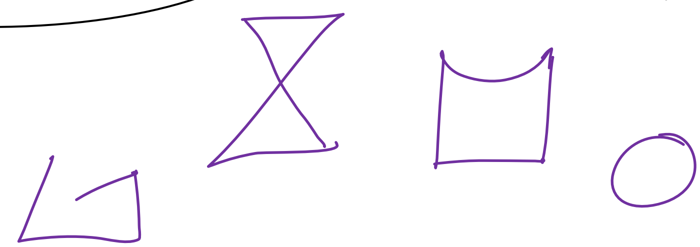
Non-Characteristics
- curved sides
- open
- non-consecutive sides intersect
- more/less than 4 sides

DEFINITION
4 sided polygon

Examples



Non – Examples

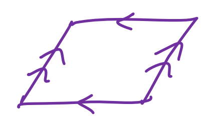


PARALLELOGRAMS

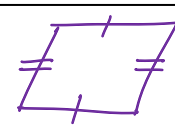
Category (What is it?): polygon (many sides) → Quadrilateral

Properties → **Illustrations** (What are some examples?)

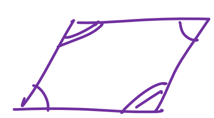
1. opposite sides are parallel.



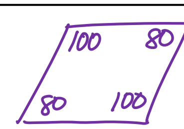
2. opposite sides are congruent



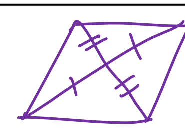
3. opposite angles are congruent



4. consecutive ∠s are supplementary



5. diagonals bisect each other

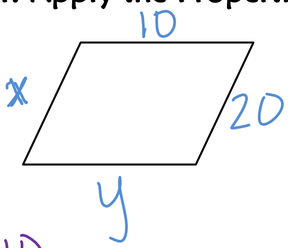


Properties as a conditional: IF ▱, THEN property

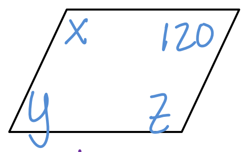
6.2 Day 1 Notes: Properties of Parallelograms

Target: Use properties of parallelograms to solve algebraic problems.
Target: Use the properties of a parallelogram to write a two-column proof.

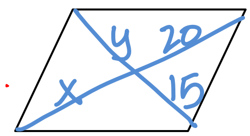
Part 1: Apply the Properties of Parallelograms to these examples to solve for the missing variables.



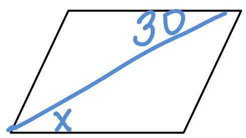
x=10
y=20



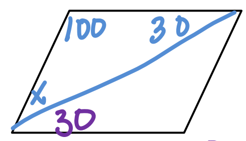
x=60
y=120
z=60



x=20
y=15



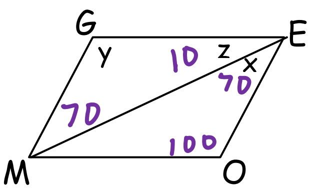
x=30°



x=50°

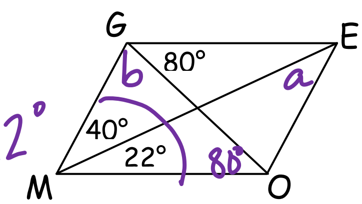
Part 2: Find the missing angles in the parallelograms.

1)



x = 70   y = 100   z = 10

2)



62°

180
− 62
118

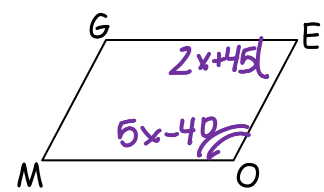
118
− 80
38°

a = 40°   b= 38°

3) Given: GEOM is a ▱
∠GEO = (2x+45)
∠EOM = (5x−40)

Find x.

2x+45+5x−40=180
7x+5=180
7x=175
x=25



4) Given: GEOM is a ▱
GM = 2x − 8
MO = x − 21
OE = 5y + 10
GE = 3y − 15
Find: x and y

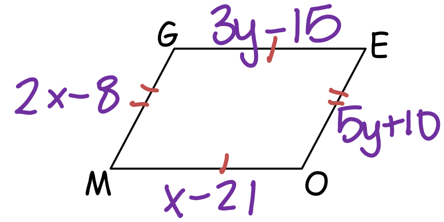
GE = MO
① 3y−15=x−21
−x+3y=−6

GM= OE
2x−8= 5y+10
② 2x−5y=18

2(−x+3y=−6)

+ 2x−5y=18
−2x+6y=−12
y=6

−x+3y=6
−x+3(6)=6
−x=−24
x=24



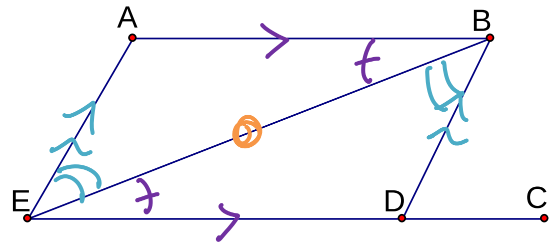
Time for Some Proofs ☺

5) Prove a property of Parallelograms:

Given: $\overline{AB} \parallel \overline{ED}$

$\overline{AE} \parallel \overline{BD}$

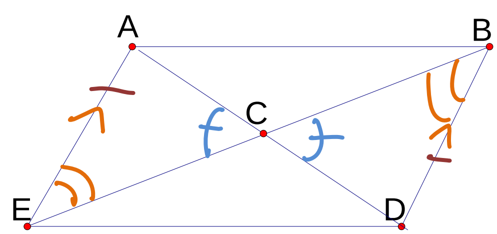
Prove: $\overline{AB} \cong \overline{ED}$ and $\overline{AE} \cong \overline{BD}$



① $\overline{AB} \parallel \overline{ED}$	① Given
② ∠ABE ≅ ∠DEB (A)	② If ∥ lines, then alt int ∡s ≅.
③ $\overline{AE} \parallel \overline{BD}$	③ Given
④ ∠AEB ≅ ∠DBE (A)	④ If ∥ lines, then alt. int ∡s ≅.
⑤ $\overline{EB} \cong \overline{EB}$ (S)	⑤ Reflexive Property
⑥ △ABE ≅ △DBE	⑥ ASA (2,5,4)
⑦ $\overline{AB} \cong \overline{ED}$ & $\overline{AE} \cong \overline{BD}$	⑦ CPCTC

6) Given: ▱ABDE

Prove: △ACE ≅ △DCB



many ways to prove!! FUN!!

① ▱ABDE	① Given
② ∠ACE ≅ ∠BCD (A)	② If VAs → ≅.
③ $\overline{AE} \parallel \overline{BD}$	③ If ▱ → opp sides ∥.
④ ∠AEC ≅ ∠DBC (A)	④ If ∥ lines, then alt. Int ∡s ≅.
⑤ $\overline{AE} \cong \overline{BD}$ (S)	⑤ If ▱ → opp sides ≅
⑥ △ACE ≅ △DCB	⑥ AAS (2,4,5)