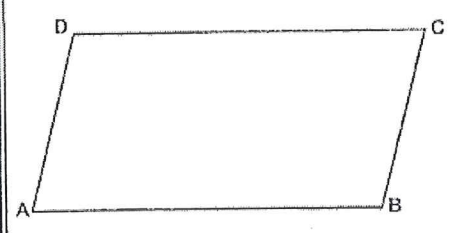


Name: key

Hour: \_\_\_\_\_

# Practice Examples: Parallelogram Properties Notes



- Four sides.
- Both pairs of opposite sides are parallel.
- Both pairs of opposite sides are congruent.
- Both pairs of opposite angles are congruent.
- Diagonals bisect each other.

Example Proof:  
Given: Parallelogram URST  
Prove:  $\angle R \cong \angle T$



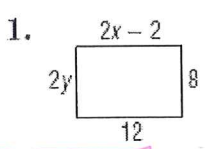
1. Parallelogram URST
2.  $UT \parallel RS$   
 $UR \parallel TS$
3.  $\angle R + \angle S = 180$   
 $\angle T + \angle S = 180$
4.  $\angle R + \angle S = \angle T + \angle S$
5.  $\angle R \cong \angle T$

1. given
2. def of parallelogram
3. con. int  $\angle$ s are suppl.
4. substitution
5. subtraction.

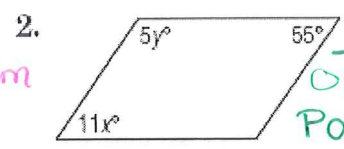
Make sure you justify your set up!

1 pt for justify, 1 pt for answer.

Find  $x$  and  $y$  so that each quadrilateral is a parallelogram.



Opposite sides of a parallelogram are  $\cong$

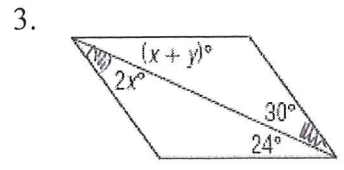


Find  $x$   
Opposite  $\angle$ s of a Parallelogram are  $\cong$   
 $55 = 11x$   
 $5 = x$

Find  $x$   
 $2x - 2 = 12$   
 $2x = 14$   
 $x = 7$

Find  $y$   
 $2y = 8$   
 $y = 4$

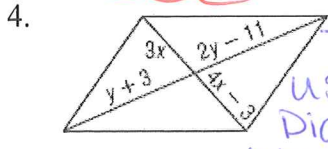
Find  $y$   
 $55 + 5y = 180$  con. int  $\angle$ s of a Parallelogram are suppl.  
 $y = 25$



$2x = 30$  alt int  $\angle$ s are  $\cong$   
 $x = 15$  b/c sides of a parallelogram are parallel by def.

$24 = x + y$   
 $24 = 15 + y$  substitution

$9 = y$

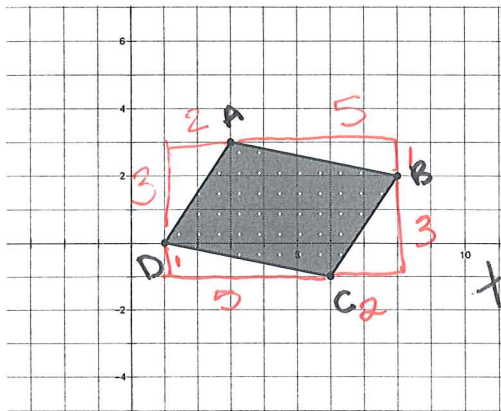


To find both  $x$  and  $y$  use:  
Diagonals of parallelograms bisect each other thus cutting into 2  $\cong$  parts.

$3x = 4x - 3$   
 $x = 3$   
 $y + 3 = 2y - 11$   
 $14 = y$

Coordinate Examples:

5. Determine whether the figure with vertices A(3,3), B(8,2), C(6,-1), D(1,0) is a parallelogram. To be a parallelogram, you must test for Opposite Sides parallel



\* To check for opposite sides // must only check for slopes \*

must show all slopes

+1/2  
Slope AB =  $-\frac{1}{5}$  > AB // CD  
Slope CD =  $-\frac{1}{5}$

Slope AD =  $\frac{3}{2}$   
Slope BC =  $\frac{3}{2}$  > AD // BC

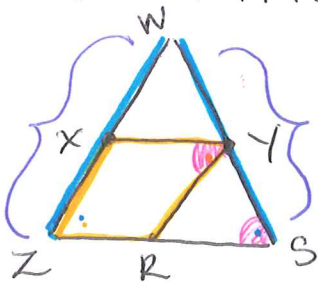
must conclude AB // CD and AD // BC

∴ Quadrilateral ABCD is a Parallelogram by definition

+2pts

1. Proofs

Given: para XYRZ  
WZ ≅ WS  
Prove: ∠XYR ≅ ∠S



1. para XYRZ  
WZ ≅ WS

2. ∠Z ≅ ∠S

3. ∠Z ≅ ∠XYR

4. ∠XYR ≅ ∠S

1. given

2. base ∠s of isosc. Δs are ≅

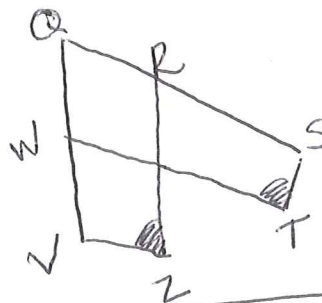
3. opp. ∠s of a Parallelogram are ≅

4. Substitution

2.

Given: parallelogram VZRC  
Parallelogram WQST

Prove: ∠Z ≅ ∠T



1. ~~Given~~ Para VZRC  
Para WQST

2. ∠Z ≅ ∠C  
∠Q ≅ ∠T

3. ∠Z ≅ ∠T

1. given

2. opp. ∠s of a Parallelogram are ≅

3. Substitution