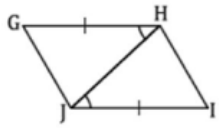
CPCTC and Parallelogram Test Review Name_____

1. Given: $\overline{GH} \cong \overline{IJ}$, $\angle GHJ \cong \angle IJH$

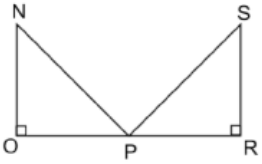


Prove: $\overline{GJ} \cong \overline{IH}$

S	R
$\overline{GH} \cong \overline{IJ}$	Given
$\angle GHJ \cong \angle IJH$	Given
$\overline{HJ} \cong \overline{JH}$	Reflexive Prop.
$\triangle GHJ \cong \triangle IJH$	SAS
$\overline{GJ} \cong \overline{IH}$	CPCTC

2. Given: $\overline{NP} \cong \overline{SP}$ and P is the midpoint of $\overline{OR}$

Prove: $\angle OPN \cong \angle RPS$



S	R
$\overline{NP} \cong \overline{SP}$	Given
P is midpoint of $\overline{OR}$	Given
$\overline{OP} \cong \overline{RP}$	Def. of midpoint
$\triangle NOP \cong \triangle SRP$	HL
$\angle OPN \cong \angle RPS$	CPCTC

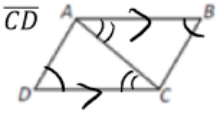
3. Given: $\angle HIJ \cong \angle KLJ$ and $\overline{HJ} \cong \overline{KJ}$

Prove: $\overline{FG} \cong \overline{JH}$

S	R
$\angle HIJ \cong \angle KLJ$	Given
$\overline{HJ} \cong \overline{KJ}$	Given
$\angle HJI \cong \angle KJL$	Vertical $\angle$'s Thm
$\triangle HJI \cong \triangle KJL$	AAS
$\overline{FG} \cong \overline{JH}$	CPCTC

4. Given: $\angle ABC \cong \angle CDA$ and $\overline{AB} \parallel \overline{CD}$

Prove: $\overline{BC} \cong \overline{DA}$

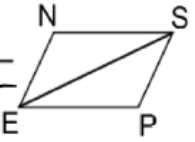


S	R
$\angle ABC \cong \angle CDA$	Given
$\overline{AB} \parallel \overline{CD}$	Given
$\angle BAC \cong \angle DCA$	Alt. Int. $\angle$'s Thm
$\overline{AC} \cong \overline{CA}$	Reflexive Prop
$\triangle ABC \cong \triangle CDA$	AAS
$\overline{BC} \cong \overline{DA}$	CPCTC

It is recommended that you review all proofs for parallelograms and their converses.

Given: PENS is a parallelogram

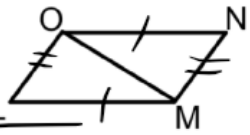
Prove: $\overline{PE} \cong \overline{NS}$ and $\overline{EN} \cong \overline{SP}$



S	R
PENS is a $\square$	Given
$\overline{NE} \parallel \overline{SP}$	Def. of parallelogram
$\overline{NS} \parallel \overline{EP}$	Def. of parallelogram
$\angle NSE \cong \angle PES$	Alt. Int. $\angle$'s
$\angle PSE \cong \angle NES$	Alt. Int. $\angle$'s
$\overline{ES} \cong \overline{SE}$	Reflexive Prop
$\triangle NES \cong \triangle PSE$	ASA
$\overline{PE} \cong \overline{NS}$	CPCTC
$\overline{EN} = \overline{PS}$	CPCTC

Given: $\overline{ON} \cong \overline{ML}$ and $\overline{LO} \cong \overline{NM}$

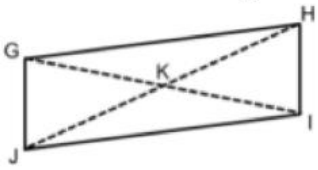
Prove: LMNO is a parallelogram



S	R
$\overline{ON} \cong \overline{ML}$	Given
$\overline{LO} \cong \overline{NM}$	Given
$\overline{OM} = \overline{MO}$	Reflexive
$\triangle MOL \cong \triangle OMN$	SSS
$\angle LOM \cong \angle NMO$	CPCTC
$\angle NOM \cong \angle LMO$	CPCTC
$\overline{OL} \parallel \overline{NM}$ & $\overline{ON} \parallel \overline{LM}$	Converse of Alt. Int $\angle$'s
LMNO is a parallelogram	Def. of $\square$

GHIJ is a parallelogram. Find the value of each of the following variables.

. a. $\overline{GH} = 9x - 4$ and $\overline{JI} = 5x + 12$



opp sides ≅

$9x-4=5x+12$

$4x-4=12$

$4x=16$

$x=4$

b. $\angle HGJ = (11y + 68)^o$ and $\angle GHI = (13y + 4)^o$

consecutive ∠'s supp.

$11y+68+13y+4=180$

$24y+72=180$

$24y=108$

$y=4.5$

c. $\angle GJI = (3w + 10)^o$ and $\angle IHG = (9w - 98)^o$

opp ∠'s ≅

$3w+10=9w-98$

$10=6w-98$

$108=6w$

$w=18$

d. $\overline{GK} = 3z + 2$ and $\overline{GI} = z + 34$

1 2

Diagonals bisect

$2(3z+2)=z+34$

$6z+4=z+34$

$5z+4=34$

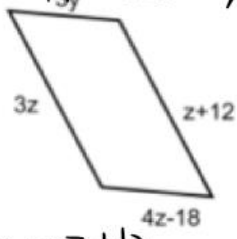
$5z=30$

$z=6$

9. Determine the value of each variable that would make the following a parallelogram. Explain which converse property would make it a parallelogram.

a.

opp sides ≅ → □



$3z=z+12$

$2z=12$

$z=6$

$4z-18=3y$

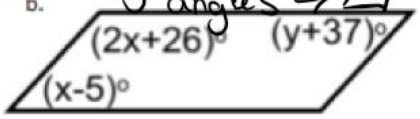
$4(6)-18=3y$

$6=3y$

$2=y$

b.

1 angle supp. to both Consecutive angles → □



$2x+26+x-5=180$

$3x+21=180$

$3x=159$

$x=53$

$2x+26+y+37=180$

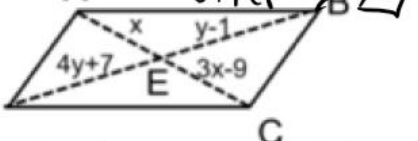
$2(53)+26+y+37=180$

$y+169=180$

$y=11$

c.

Diagonals bisect each other → □



$x=3x-9$

$-2x=-9$

$x=4.5$

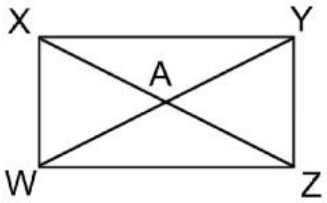
$4y+7=y-1$

$3y+7=-1$

$3y=-8$

$y=-\frac{8}{3}$

10. The following figure is a rectangle. Find the value of the given variable.



a. $\overline{XA} = 2x + 4$ and $\overline{WA} = 3x - 2$

$2x+4=3x-2$

$4=x-2$

$6=x$

b. $\overline{XZ} = 6x - 5$ and $\overline{YW} = 2x + 19$

$6x-5=2x+19$

$4x-5=19$

$4x=24$

$4x=24$

$x=6$

c. $\overline{YA} = x + 3$ and $\overline{XZ} = 5x - 9$

1 2

$2(x+3)=5x-9$

$2x+6=5x-9$

$6=3x-9$

$15=3x$

$15=3x$

$x=5$