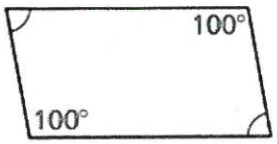
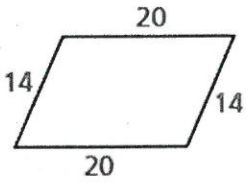
Name: AK

7.3 Practice Problems

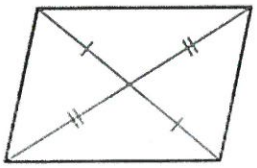
1. State the theorem (or describe how you know) that proves each quadrilateral is a parallelogram.



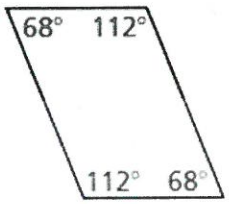
opp angles converse.



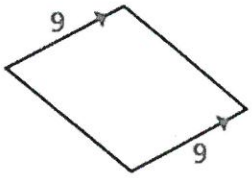
opp sides converse



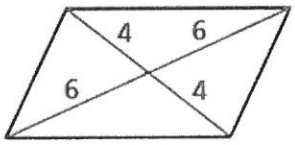
parallelogram diagonals converse.



opp angles Converse

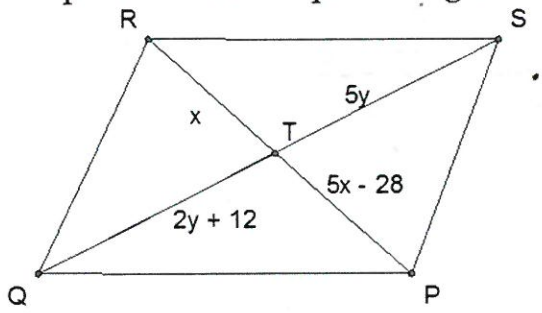


opp sides ~~are~~ parallel and congruent theorem



parallelogram diagonals converse

2. Find the values of x and y that ensures each quadrilateral is a parallelogram.



$x = 5x - 28$

$\frac{28}{4} = \frac{4x}{4}$

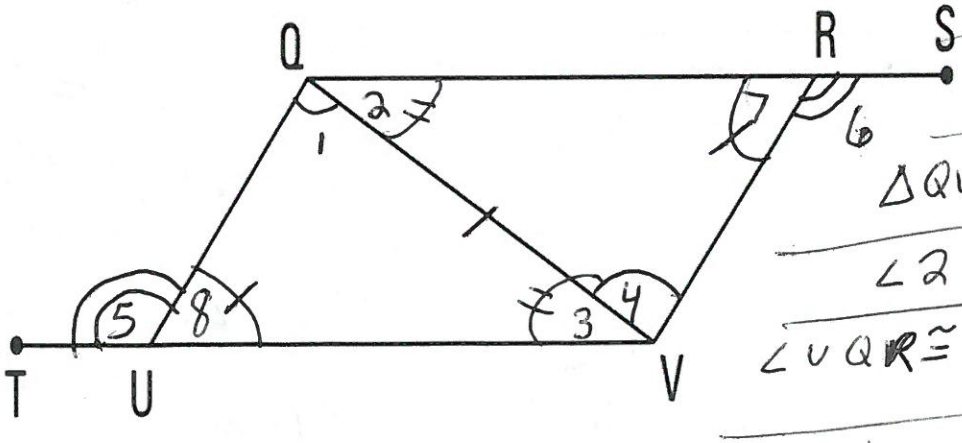
$7 = x$

$5y = 2y + 12$

$\frac{3y}{3} = \frac{12}{3}$

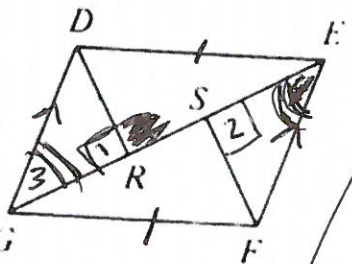
$y = 4$

3. Given: $\angle UQV \cong \angle RVQ$
$\angle TUQ \cong \angle SRV$
Prove: $QRVU$ is a parallelogram



S	R
	Given
$QV = QV$	Reflexive Prop.
$\angle 8 \cong \angle 7$	Supplementary to congruent angles.
$\triangle QVV \cong \triangle VRQ$	AAS
$\angle 2 \cong \angle 3$	CPCTC
$\angle UQR \cong \angle RVU$	Angle Addition Postulate
$QRVU$ is a $\square$	Opp Angles Converse.

S	R
4. Given: $DEFG$ is a $\square$; $\overline{DR} \perp \overline{GE}$; $\overline{FS} \perp \overline{GE}$	Given
~~Prove: $\overline{DR} \cong \overline{FS}$~~	
$m\angle 1 = 90°$	Def of Perp.
$m\angle 2 = 90°$	Transitive Prop.
$\angle 1 \cong \angle 2$	Opp Sides Thm
$DE = GF$	Def of Parallelogram
$DG \parallel EF$	Alt. Interior Angles Thm
$\angle 3 \cong \angle 4$	

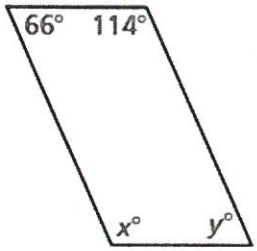


AA

$\triangle DRG \cong \triangle FSE$ AAS

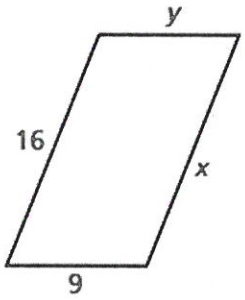
$DR \cong FS$ CPCTC

5. Find x and y that proves each quadrilateral is a parallelogram.



$y = 66$

$x = 114$

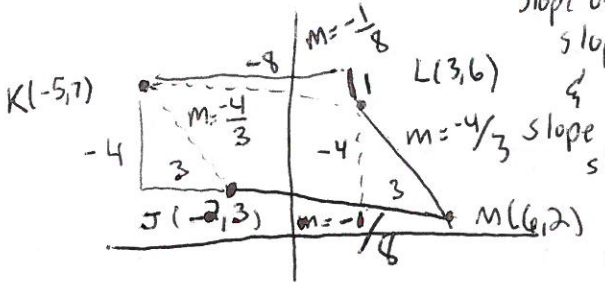


$x = 16$

$y = 9$

6. Prove that the following coordinates are the vertices of a parallelogram.

a) J(-2, 3), K(-5, 7), L(3, 6), M(6, 2)



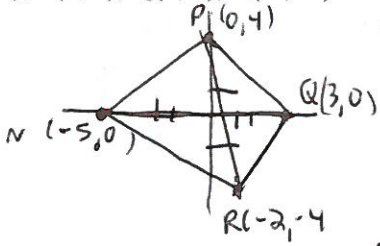
Slope of $\overline{KJ}$ = slope of $\overline{LM}$

&

Slope of $\overline{KL}$ = slope of $\overline{JM}$

$\therefore$ JKLM is a parallelogram.

b) N(-5, 0), P(0, 4), Q(3, 0), R(-2, -4)



Midpoint of $\overline{PR} = (-1, 0)$

Midpoint of $\overline{QN} = (-1, 0)$

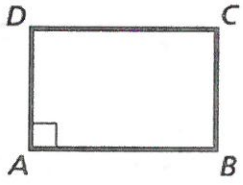
$\therefore$ The diagonals bisect.

NPQR is a parallelogram.

7. **PROOF** Write a proof.

Given: $ABCD$ is a parallelogram.
$\angle A$ is a right angle.

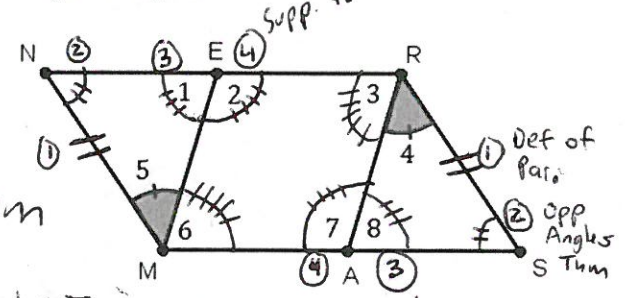
Prove $\angle B$, $\angle C$, and $\angle D$ are right angles.



S	R
$\angle A \cong \angle C$	Given
$m\angle C = 90°$	opp sides thm
$m\angle A + m\angle D = 180°$	Substitution
$90° + m\angle D = 180°$	Consecutive Angles Thm
$m\angle D = 90°$	Substitution
$\angle D \cong \angle B$	subtraction POE
$m\angle B = 90°$	Opp sides thm
$\angle B, \angle C, \angle D$ are right angles	Substitution
	Def of Right Angle

8. **Given:** $NRSM$ is a parallelogram
$\angle 4 \cong \angle 5$

Prove: $ERAM$ is a parallelogram



Supp to same angle

(1) Def of Para.

(2) Opp Angles Thm

(3) cpctc

(4) $\angle 4 \cong \angle 3$ opp angles theorem

(5) $\angle NMS \cong \angle SRN$ substitution

(6) $\angle 6 \cong \angle 3$ Subtraction

(7) ERAM is a $\square$ opp angles converse.