H. Geom. Quads REVIEW **Name** Key

1. Identify each quadrilateral below

   a. Diagonals congruent and two pairs of opposite congruent angles.
   Rectangle

   b. Diagonals perpendicular and has point symmetry.
   Rhombus

   c. Exactly one line of symmetry which also bisects angles.
   Kite

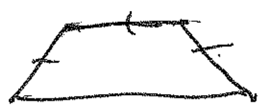
   d. Two pairs of opposite congruent sides.
   Parallelogram

2. Does SSSS work as a congruence theorem for quadrilaterals.
   Make a drawing and *explain* your answer.

   No, a square & rhombus have the same sides, but are not ≅ (SSSSA works)

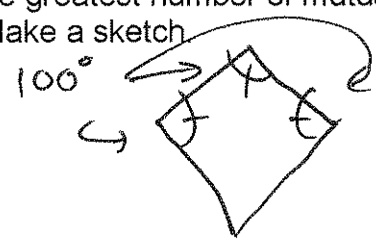
3. a. What is the greatest number of mutually congruent sides possible in a quadrilateral if it is *not* a rhombus? Make a sketch. 3

   ex

   b. What is the greatest number of mutually congruent angles if *not* a rectangle? Make a sketch. 3

   ex

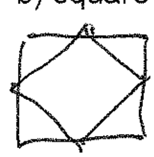
   

4. What quadrilateral is formed by joining the midpoints of a...

a) rectangle?

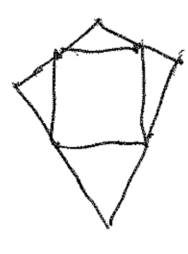
rhombus

b) square?



square

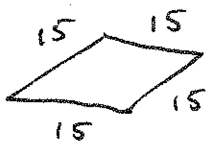
c) kite?



rect.

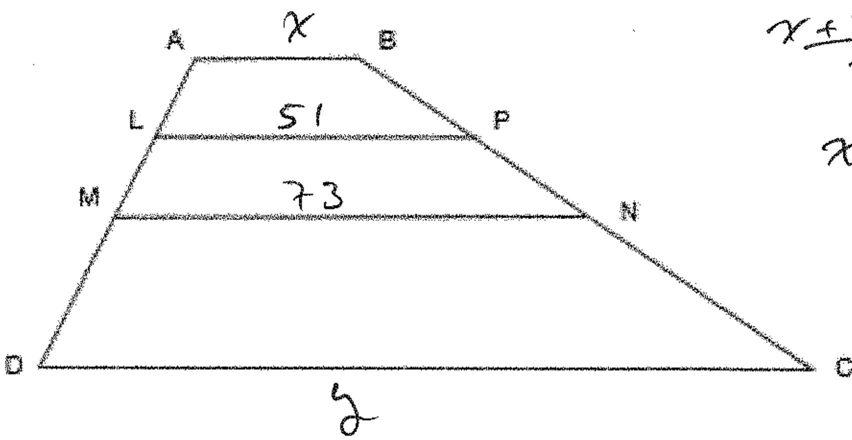
5. A rhombus has a perimeter of 60 cm. Which of these could *not* be the length of one of its diagonals?

(a) 1 cm (b) 5 cm (c) 10 cm (d) 20 cm (e) all are possible



Δ ineq $\rightarrow$ $0 < d < 30$

6. In the drawing of a trapezoid ABCD below, L, M, N and P are all midpoints (L and P are midpoints of AM and BN). LP = 51 and MN = 73. Find the length of $\overline{CD}$.



$$\frac{x+73}{2} = 51$$

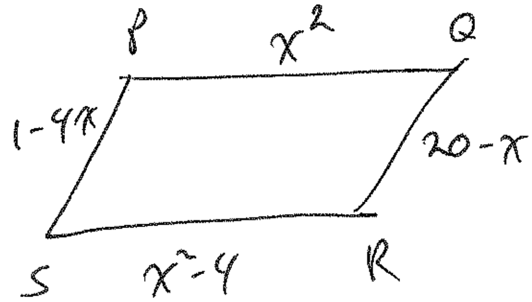
$$x = 29$$

$$\frac{x+y}{2} = 73$$

$$29 + y = 146$$

$$y = 117$$

7. The lengths of the sides of quadrilateral PQRS are PQ = x^2, QR = 20 - x, RS = $x^2 - 4$ and PS = $1 - 4x$. Find a value of x that will make PQRS a kite.



2 options

PQ = QR

$x^2 = 20 - x$

$x^2 + x - 20 = 0$

$x = -5$ or 4

$-5 \rightarrow \{25, 25, 21, 21\}$

$4 \rightarrow \{16, 16, 12, -15\}$

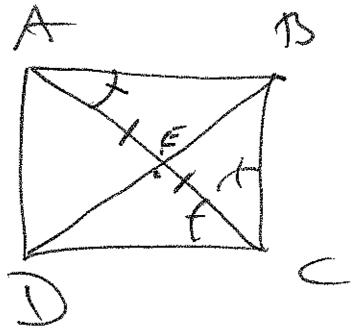
PQ = PS

$x^2 = 1 - 4x$

$x^2 + 4x - 1 = 0$

$x = \frac{-4 \pm \sqrt{15}}{2}$

8. *Given:* $\angle BAC \cong \angle ACD$,
$\overline{BD}$ *bis* $\overline{AC}$, and
$\overline{AC}$ *bis* $\angle BCD$



Prove: ABCD is a rhombus

A $\angle BAC \cong \angle ACD$	G
$\overline{AB} \parallel \overline{CD}$	$\cong$ alt int $\angle$'s $\rightarrow \parallel$
$\overline{BD}$ bis $\overline{AC}$	G
S $\overline{AE} \cong \overline{EC}$	bis $\rightarrow$ midpt $\rightarrow$ 2 $\cong$ segs
A $\angle AEB \cong \angle CED$	vert $\angle$'s $\cong$
$\triangle ABE \cong \triangle CDE$	ASA
$\overline{AB} \cong \overline{CD}$	CPCTC
ABCD $\parallel$-gram	1 pr opp sides $\cong$ & $\parallel \rightarrow \parallel$-gram
$\overline{AC}$ bis $\angle BCD$	G
$\angle BCE \cong \angle DCE$	$\angle$ bis $\rightarrow$ 2 $\cong$ $\angle$'s
$\angle BAE \cong \angle BCE$	trans
$\overline{AB} \cong \overline{BC}$	isos $\triangle$ thm
$\overline{BC} \cong \overline{AD}$	$\parallel$-gram $\rightarrow \cong$ opp sides
$\overline{AB} \cong \overline{BC} \cong \overline{CD} \cong \overline{AD}$	trans
ABCD rhombus	4 $\cong$ sides $\rightarrow$ rhombus

9. Two sides of quadrilateral ABCD are parallel and $\overline{AC}$ bisects $\overline{BD}$. Identify and prove.

$\overline{AB} \parallel \overline{CD}$	G
$\angle 1 \cong \angle 2$, $\angle 3 \cong \angle 4$	$\parallel \rightarrow \cong$ alt int $\angle$'s
$\overline{AC}$ bis $\overline{BD}$	G
$\overline{BE} \cong \overline{ED}$	bis $\rightarrow$ midpt $\rightarrow \cong$ segs
$\triangle ABE \cong \triangle CDE$	AAS
$\overline{AB} \cong \overline{CD}$	CPCTC
ABCD $\parallel$-gram	1 pr sides $\cong$ & $\parallel \rightarrow \parallel$-gram