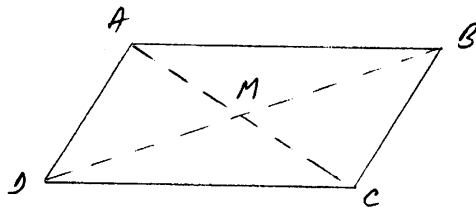


### QUIZ #3 @ 50 points

Write in a neat and organized fashion. Use a pencil. Show all work to get credit.

1. Draw a parallelogram. Answer the following questions. Use math notation pertinent to your drawing:



a) How are the sides of the parallelogram?

$$\overline{AB} \parallel \overline{DC}, \quad \overline{AB} \cong \overline{DC}$$

$$\overline{AD} \parallel \overline{BC}, \quad \overline{AD} \cong \overline{BC}$$

c) How are the diagonals of the parallelogram?

$$\overline{AC} \not\cong \overline{BD}$$

$$\overline{AC} \text{ bisects } \overline{BD} : \overline{DM} \cong \overline{MB}$$

$$\overline{BD} \text{ bisects } \overline{AC} : \overline{AM} \cong \overline{MC}$$

b) How are the opposite angles of the parallelogram?

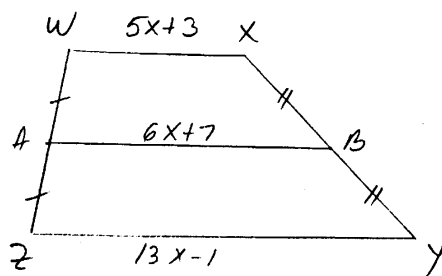
$$\angle A \cong \angle C$$

$$\angle B \cong \angle D$$

d) What is the sum of the measures of the angles?

$$m\angle A + m\angle B + m\angle C + m\angle D = 360^\circ$$

2. Let WXYZ a trapezoid with bases  $WX = 5x + 3$  and  $ZY = 13x - 1$ . If the median  $AB = 6x + 7$ , find  $x$ . Justify your answer.



2

Given: WXYZ trapezoid

$$WX = 5x + 3$$

$$ZY = 13x - 1$$

AB - median

$$AB = 6x + 7$$

Find  $x$

Solution

AB - median  $\Rightarrow$

$$AB = \frac{1}{2}(WX + ZY)$$

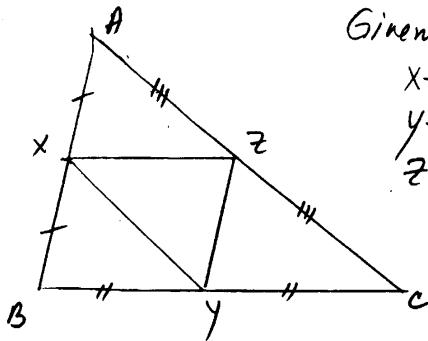
$$6x + 7 = \frac{1}{2}(5x + 3 + 13x - 1)$$

$$12x + 14 = 18x + 2$$

$$14 - 2 = 18x - 12x$$

$$6x = 12 \Rightarrow x = 2$$

3. Given  $\triangle ABC$  with X, Y, Z midpoints of the respective sides with  $AB = 10\text{cm}$ ,  $BC = 14\text{cm}$ , and  $AC = 18\text{cm}$  find XY, YZ, and XZ. Justify your answers.



Given:  $\triangle ABC$   
 X - midpt  $\overline{AB}$   
 Y - midpt  $\overline{BC}$   
 Z - midpt  $\overline{AC}$   
 $AB = 10\text{cm}$   
 $BC = 14\text{cm}$   
 $AC = 18\text{cm}$

Find: XY, YZ, XZ

Solution

X, Z - midpts  $\Rightarrow XZ = \frac{1}{2} BC$

$XZ = \frac{1}{2} 14 = 7\text{cm}$

X, Y - midpts  $\Rightarrow XY = \frac{1}{2} AC$

$XY = \frac{1}{2} 18 = 9\text{cm}$

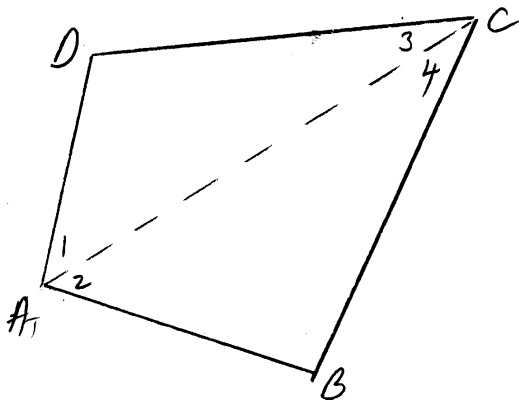
Y, Z - midpts  $\Rightarrow YZ = \frac{1}{2} AB$

$YZ = \frac{1}{2} 10 = 5\text{cm}$

4. Prove the following property (formal proof):

The sum of the interior angles of a quadrilateral is 360 degrees.

Make sure you state the hypothesis and conclusion using math notation pertinent to your drawing.



Given: ABCD - quadrilateral

Prove  $m\angle A + m\angle B + m\angle C + m\angle D = 360^\circ$

Proof

Reasons

- Statements
1. ABCD - quod.
  2. draw  $\overline{AC}$
  3.  $m\angle 1 + m\angle 3 + m\angle D = 180^\circ$  ( $\triangle AOC$ )
  3.  $m\angle 2 + m\angle 4 + m\angle B = 180^\circ$  ( $\triangle ABC$ )
  4.  $(m\angle 1 + m\angle 3 + m\angle D) + (m\angle 2 + m\angle 4 + m\angle B) = 360^\circ$
  5.  $(m\angle 1 + m\angle 2) + m\angle B + (m\angle 3 + m\angle 4) + m\angle D = 360^\circ$
  6.  $m\angle 1 + m\angle 2 = m\angle A$
  6.  $m\angle 3 + m\angle 4 = m\angle C$
  7.  $m\angle A + m\angle B + m\angle C + m\angle D = 360^\circ$

1. given
2. Two pts determine a line
3. Sum  $\angle$ 's in  $\triangle = 180^\circ$
4. + prop. of =
5. Associative prop of +
6. Angle-Addition Postulate
7. Substitution

(5.6)

Q.E.D.