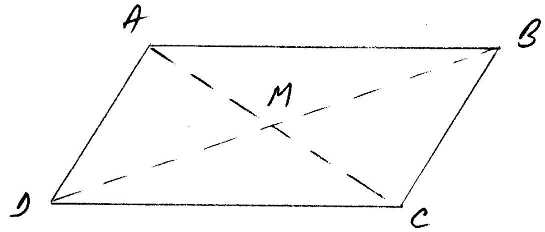
Math 61 Spring 2007 Name:

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? ~~parallelogram~~?

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

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

c) How are the diagonals of the parallelogram?

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

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

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

b) How are the opposite angles of the parallelogram? ~~angles~~?

$\angle A \cong \angle C$

$\angle B \cong \angle D$

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

$m\angle A + m\angle B + m\angle C + m\angle D = 360°$

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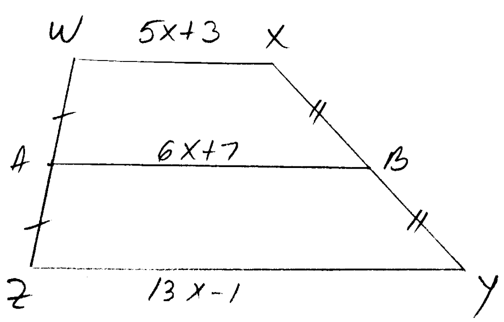
2. Let WXYZ a trapezoid with bases $WX = 5x + 3$ and $ZY = 13x - 1$. If the median $AB = 6x + 7$,find x. Justify your answer.



Given: WXYZ trapezoid

$WX = 5X + 3$

$ZY = 13X - 1$

$\overline{AB}$ - median

$AB = 6X + 7$

Find X

Solution

$\overline{AB}$ - median $\Rightarrow$

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

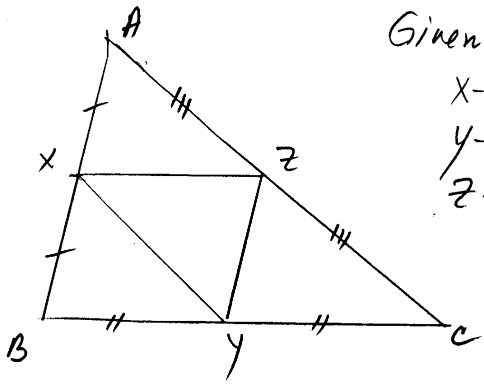
$6X + 7 = \frac{1}{2}(5X + 3 + 13X - 1)$

$12X + 14 = 18X + 2$

$14 - 2 = 18X - 12X$

$6X = 12 \Rightarrow X = 2$

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



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

Find: XY, YZ, XZ

Solution

X, Z - midpts $\Rightarrow$ $XZ = \frac{1}{2} BC$
$XZ = \frac{1}{2} 14 = 7cm$

X, Y - midpts $\Rightarrow$ $XY = \frac{1}{2} AC$
$XY = \frac{1}{2} 18 = 9cm$

Y, Z - midpts $\Rightarrow$ $YZ = \frac{1}{2} AB$
$YZ = \frac{1}{2} 10 = 5cm$

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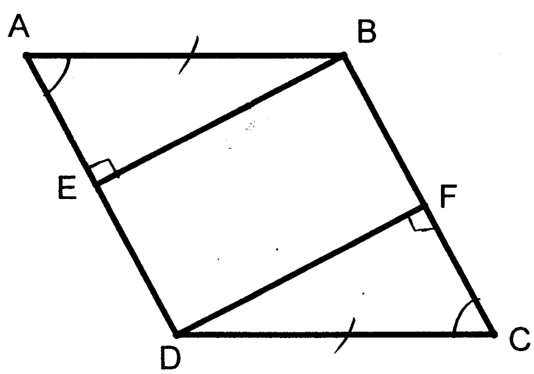
4. Given a rhombus ABCD with $\overline{BE} \perp \overline{AD}$ and $\overline{DF} \perp \overline{BC}$, prove $\overline{BE} \cong \overline{DF}$. <u>FORMAL PROOF</u>



Given: ABCD rhombus
$\overline{BE} \perp \overline{AD}$
$\overline{DF} \perp \overline{BC}$

Prove: $\overline{BE} \cong \overline{DF}$

Proof

Statements	Reasons
1. ABCD rhombus	1. given
2. $\overline{BE} \perp \overline{AD}$, $\overline{DF} \perp \overline{BC}$	2. given
3. $\angle AEB$, $\angle DFC$ = right $\angle$'s	3. $\perp$ iff right $\angle$'s
4. $\triangle AEB$, $\triangle DFC$ = right $\triangle$'s	4. def. right $\triangle$'s
5. $\triangle AEB$, $\triangle DFC$ right $\triangle$'s $\begin{cases} \overline{AB} \cong \overline{CD} \\ \angle A \cong \angle C \end{cases}$	5. $\begin{cases} \text{all sides rhombus } \cong \\ \text{Opp } \angle\text{'s rhombus } \cong \end{cases}$
6. $\triangle AEB \cong \triangle DFC$	6. HA
7. $\overline{BE} \cong \overline{DF}$	7. CPCTC