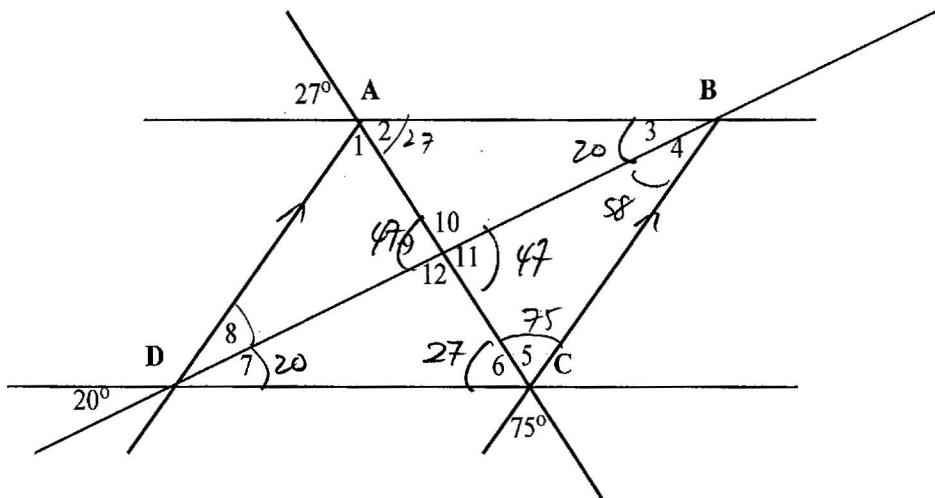


100 points

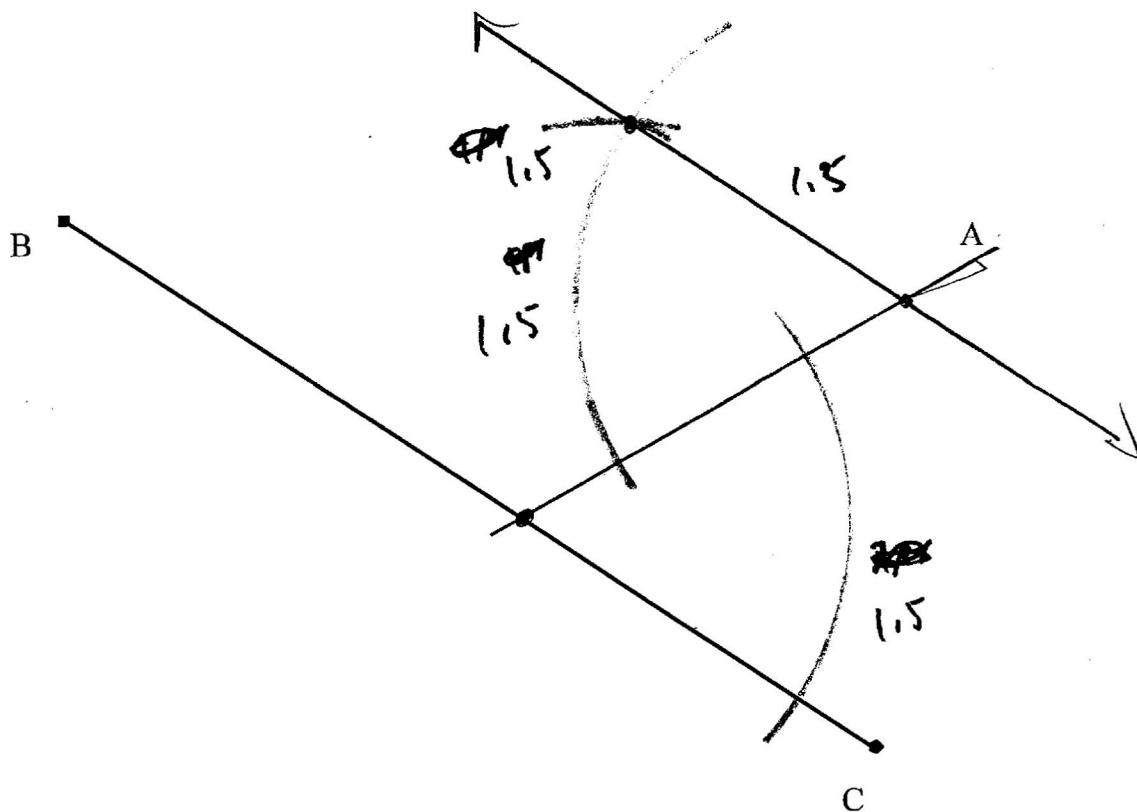
Show all work to receive full credit. You may use a calculator. CHECK YOUR WORK!!!!

1. (12 pts) Given the figure shown below with $\overline{AB} \parallel \overline{CD}$ and $\overline{AD} \parallel \overline{BC}$. Determine the measures of $\angle 1$ through $\angle 12$.

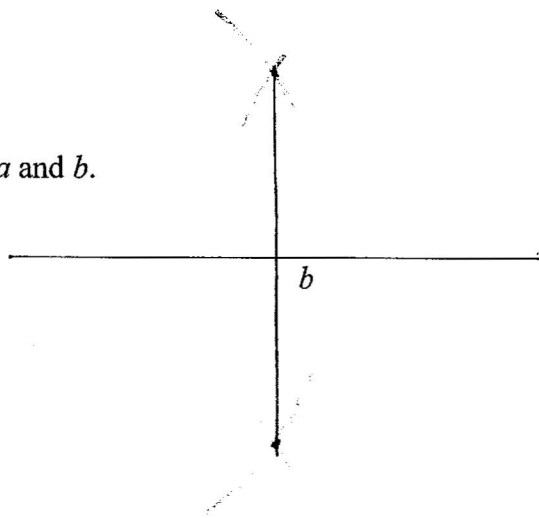
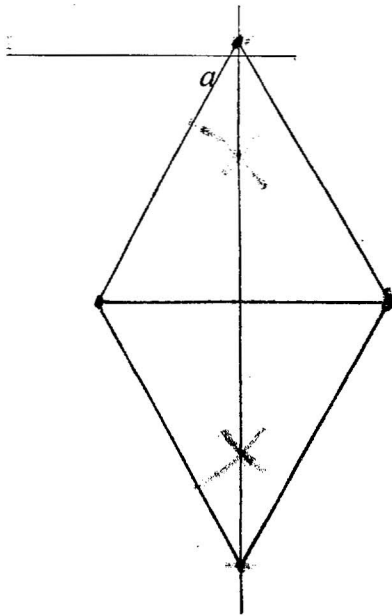
$m\angle 1 = 75^\circ$	$m\angle 7 = 20^\circ$
$m\angle 2 = 27^\circ$	$m\angle 8 = 58^\circ$
$m\angle 3 = 20^\circ$	$m\angle 9 = 47^\circ$
$m\angle 4 = 58^\circ$	$m\angle 10 = 133^\circ$
$m\angle 5 = 75^\circ$	$m\angle 11 = 47^\circ$
$m\angle 6 = 27^\circ$	$m\angle 12 = 133^\circ$



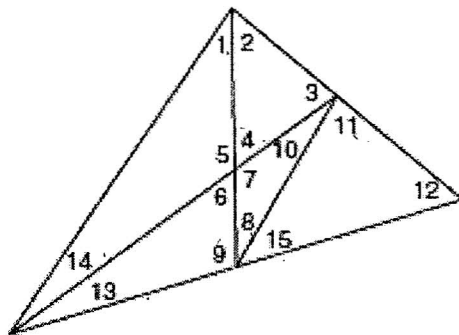
2. (6 pts) Draw a line parallel to \overline{BC} passing through Point A using a compass. Show all arcs and intersections necessary to complete the task.



3. (9 pts) Construct a rhombus with diagonals a and b .

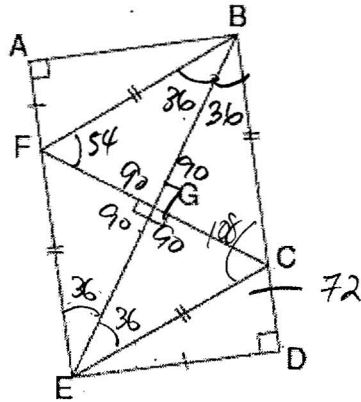


4. (12 pts) Determine if each of the following is TRUE or FALSE. If TRUE, explain why.



- A. $\angle 4 + \angle 9 + \angle 13 = 180^\circ$ TRUE ① ^{2PTS} $\angle 4 = \angle 6$, $\angle 6 + \angle 9 + \angle 13 = 180^\circ$
Forms Δ .
- B. $\angle 5 = \angle 8 + \angle 10$ FALSE ^{3PTS}
- C. $\angle 4 = \angle 1 + \angle 14$ TRUE ^{1PT} $\angle 4$ IS EXTERIOR \angle OF Δ ,
= SUM OF 2 NON-ADJACENT INT \angle s. ^{2PTS}
- D. $\angle 2 + \angle 3 + \angle 4 + \angle 11 + \angle 12 + \angle 15 = 360^\circ$. TRUE ^{1PT}
 $\angle 2 + \angle 3 + \angle 4$ FORM Δ
= 180°
 $\angle 11 + \angle 12 + \angle 15$ FORM Δ
= 180° ^{2PTS}

5. (9 pts) In the following figure, $\angle GBC = 36^\circ$. Find the measures of the following angles:



A. $m\angle GFB = \underline{54^\circ}$ 3PTS

B. $m\angle BCE = \underline{108^\circ}$ 3PTS

C. $m\angle CED = \underline{18^\circ}$ $90 - 72^\circ$
3PTS

6. (2 pts each) Do the following lengths of sides form a right triangle? If not, state the reason why.

A. 6, 8, 10 Yes 2PTS

B. 9, 7, 17 NO 1PT $9^2 + 7^2 = 17^2$ $81 + 49 \neq 289$ 1PT

C. $x, 2x, 3x$ NO. VIOLATES PYTHAGOREAN THM. 1PT

$$x^2 + (2x)^2 = (3x)^2$$

$$x^2 + 4x^2 = 9x^2$$

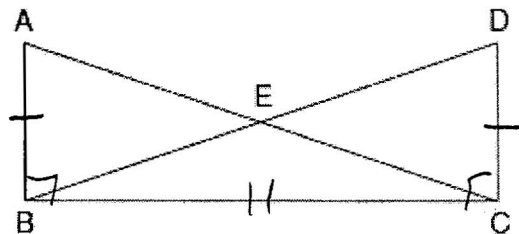
$$5x^2 = 9x^2$$

FALSE

7. (16 pts) Complete the following proof, stating the appropriate reasons justifying each statement.
 (NOTE: Fill in all the blanks in the *Statements* and *Reasons*. Not all the lines need to be used. Figure not drawn to scale.)

Given: $\overline{AB} \perp \overline{BC}$, $\overline{DC} \perp \overline{BC}$, and
 $\overline{AB} \cong \overline{CD}$

Prove: $\angle BAC \cong \angle CDB$



Statements

1. $\overline{AB} \perp \overline{BC}$, $\overline{DC} \perp \overline{BC}$
 $\overline{AB} \cong \overline{CD}$

2. $\overline{BC} \cong \overline{CB}$

3. $\triangle ABC \cong \triangle DCB$

4. $\angle BAC \cong \angle CDB$

5.

Reasons

GIVEN

REFLEXIVE PROPERTY

LL \cong THM

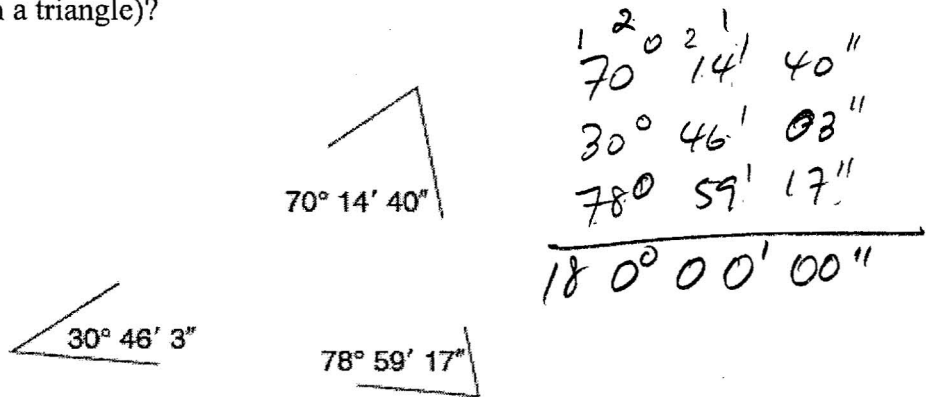
CPCT



BONUS (total of 10 extra points)

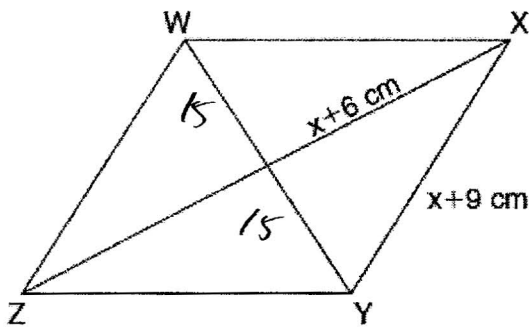


- A. (5 pts) A surveyor lays out a traverse with the three vertices as shown. Does the traverse "close" (Does it form a triangle)?



YES. Sum of \angle 's
 $= 180^{\circ}$

- B. (5 pts) Find the area of the rhombus shown if $WY = 30$ cm.



$$15^2 + (x+6)^2 = (x+9)^2$$

$$225 + x^2 + 12x + 36 = x^2 + 18x + 81$$

$$\begin{array}{r} x^2 + 12x + 261 \\ -x^2 \end{array} = \begin{array}{r} x^2 + 18x + 81 \\ -x^2 \end{array}$$

$$\begin{array}{r} 12x + 261 \\ -12x \end{array} = \begin{array}{r} 18x + 81 \\ -12x \end{array}$$

$$\begin{array}{r} 261 \\ -81 \\ \hline 180 \end{array} = \begin{array}{r} 6x + 81 \\ -81 \\ \hline 6x \end{array}$$

$$x = 30$$

$$A = 4(\text{Area } 1\Delta)$$

$$\begin{aligned} \text{Area } 1\Delta &= \frac{1}{2}(15)(36) \\ &= 270 \text{ cm}^2 \end{aligned}$$

$$A_{\text{Total}} = 4(270) \text{ cm}^2$$

$$= \boxed{1080 \text{ cm}^2}$$