

POD

$m\overline{AB} = 3x + 1$
 $m\overline{BD} = 2x - 5$
 $m\overline{CD} = 7x + 6$
 $m\overline{AC} = 5x - 20$

Find x & \overline{AB}

$$\overline{AB} + \overline{BD} = \overline{CD} + \overline{AC}$$

$$3x + 1 + 2x - 5 = 7x + 6 + 5x - 20$$

$$5x - 4 = 12x - 14$$

$$-12x = -12x$$

$$-7x - 4 = -14$$

$$+4 = +4$$

$$-7x = -10$$

$$\frac{-7x}{-7} = \frac{-10}{-7}$$

$$x = \frac{10}{7}$$

$\frac{3(10)}{7} + 1 + \frac{2(10)}{7} - 5 =$ check
 $\frac{30}{7} + \frac{7}{7} = \frac{37}{7}$

$$\frac{30}{7} + \frac{17}{7} + \frac{20}{7} - \frac{5 \cdot 7}{1 \cdot 7}$$

$$\frac{30}{7} + \frac{7}{7} + \frac{20}{7} - \frac{35}{7} = \frac{22}{7}$$

$$5\left(\frac{10}{7}\right) - 20 + 7\left(\frac{10}{7}\right) + 6$$

$$\frac{50}{7} - \frac{20 \cdot 7}{1 \cdot 7} + \frac{70}{7} + \frac{6 \cdot 7}{1 \cdot 7}$$

$$\frac{50}{7} - \frac{140}{7} + \frac{70}{7} + \frac{42}{7} = \frac{22}{7}$$

$$m\overline{AB} = 3\left(\frac{10}{7}\right) + 1$$

$$\frac{30}{7} + \frac{7}{7} = \frac{37}{7}$$

Deductive

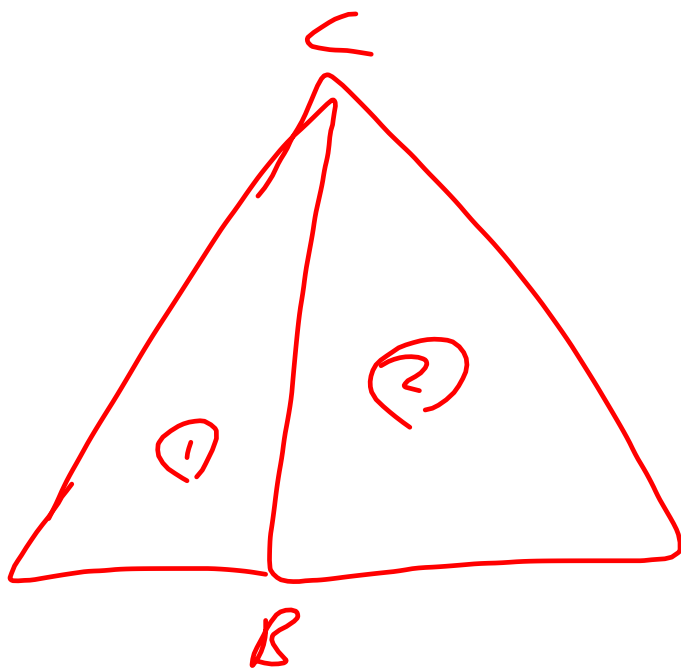
① Detachment:
Gen. & Spec.

Syllogism:

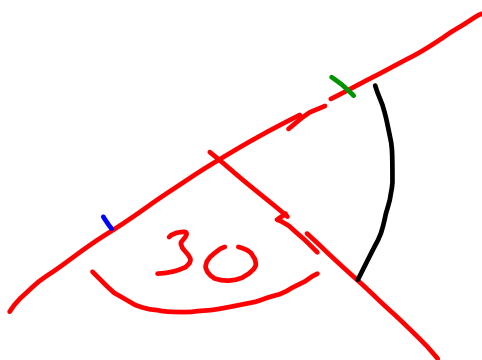
$A \rightarrow B \rightarrow C$ Chain Rule

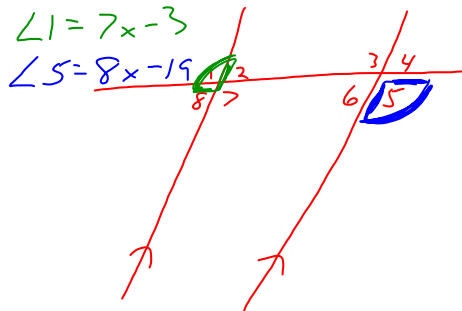
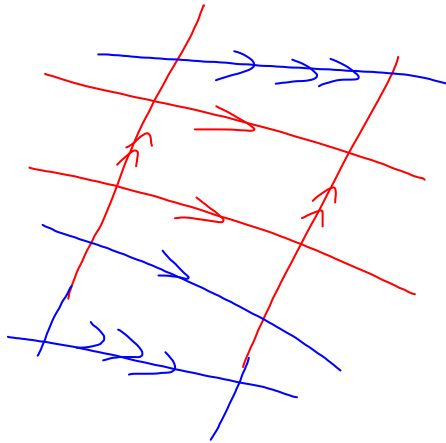
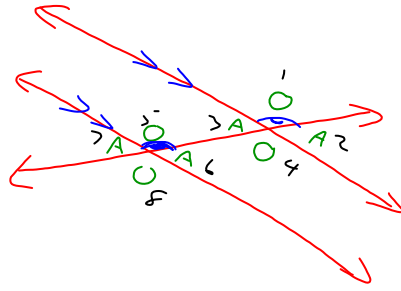
$A = B$ $B = C$

$A = C$



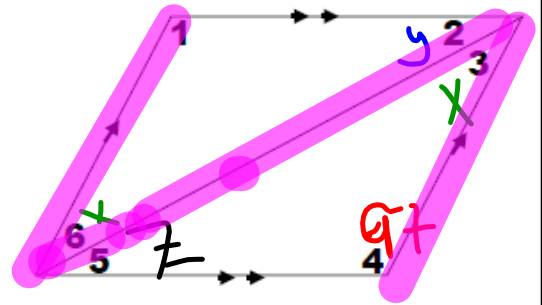
$$BC = BC$$





$7x - 3 = 8x - 19$	} Alt + EXT
$-7x \quad -7x$	
$-3 = x - 19$	} sub + prop
$+19 \quad +19$	
$16 = x$	} simplify
$x = 16$	
$\angle 5 = 8(16) - 19$	} (+) prop
$\angle 5 = 128 - 19$	
$\angle 5 = 109$	} =
$\angle 5 + \angle 4 = 180$	
$109 + \angle 4 = 180$	} Sym
$-109 \quad -109$	
$\angle 4 = 71$	} subst.
	} simplify
	} simplify
	} L.P.
	} subst.
	} (-) prop

QUICK CHECK: If $m\angle 2 = (6y + 5)^\circ$, $m\angle 3 = (5x - 16)^\circ$, $m\angle 4 = 97^\circ$, $m\angle 5 = (12z - 1)^\circ$, and $m\angle 6 = (3x)^\circ$, find the values of x , y , and z .



$x = \underline{8}$
 $y = \underline{9}$
 $z = \underline{5}$

$$\angle 3 + \angle 4 + \angle 5 = 180$$

$$12z - 1 = 59$$

$$+ 1 \quad + 1$$

$$\underline{12z = 60}$$

12

$$z = 5$$

$$x = 8$$

$$6y + 5 = 59$$

$$- 5 \quad - 5$$

$$\underline{6y = 54}$$

$$\frac{6}{6} \quad \frac{54}{6}$$

$$y = 9$$

$5x + 2y = 180$
 $-2x + 4y = 0$
 $-10x - 4y = -360$

$(5x + 2y = 180) \cdot (-2)$
 $-10x - 4y = -360$

$-10x - 4y = -360$
 $-10x - 4y = -360$

$-12x = -360$
 $x = 30$

$2y = 2x - 2y$
 $4y = 2x$
 $-2x + 4y = 0$