MATH 551 - Problem Set 7

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1.

a) If $ABC\triangle$ and $A'B'C'\triangle$ are perspective with respect to point P with $L = BC \cap B'C'$, $M = CA \cap C'A'$ and $AB \| A'B'$, then $LM \| AB \| A'B'$.

b) Given $A'B'C'\triangle$ perspective with respect to point P, and point C on line PC' and point B on line PB'. Let c be the line containing C parallel to $A'P$ and b be the containing B parallel to $A'P$, then we must have $K = b \cap A'B'$, $L = c \cap A'C'$, and $M = CB \cap C'B'$ are collinear.

c) Given two lines, one containing B and B' and the other containing C and C', let lines $x \| y$ where x goes through point B and y goes through point C and likewise lines $z \| f$ where z goes through B' and f goes through C', then we must have that $x \cap z$, $z \cap f$, and $BC \cap B'C'$ are collinear.

2.

a) Given A, B, C are collinear and A', B', C' are collinear, and $B'C \| C'B$ and $AB' \| A'B$, then we must have that $AC' || CA'$.

b) Given A', B', C' collinear and line a containing C' and line b containing A', where $a \| b$ and line d containing B' and line c containing A' where $d \| c$ and line g containing C' and line f containing B' where $g \| f$, we must have $b \cap f, d \cap a$, and $c \cap g$ are collinear.