Assignment#3 Q1 Screen Shot

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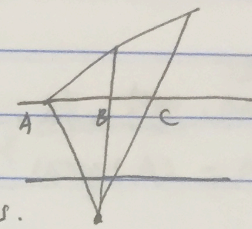
Q1 a) if using A, C to compute B, it's assumption based on

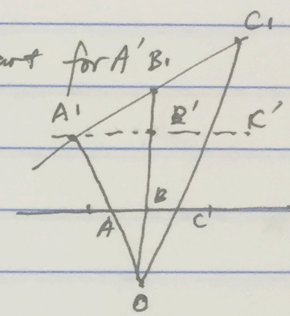
$$\frac{|AB|}{|BC|} = \frac{|A_1B_1|}{|B_1C_1|}$$



So if we prove $\frac{|AB|}{|BC|} = \frac{|A_1B_1|}{|B_1C_1|}$ statement is incorrect, then the method is erroneous.

Assume $\frac{|AB|}{|BC|} = \frac{|A_1B_1|}{|B_1C_1|}$

draw a line B'C' parrallel to AC and start for A'B1



$\because$ ~~AB~~ $B_1C' \parallel AC$

$\therefore \frac{|A_1B'|}{|B'C'|} = \frac{|AB|}{|BC|}$

$\therefore \frac{|A_1B'|}{|B'C'|} = \frac{|A_1B_1|}{|B_1C_1|}$

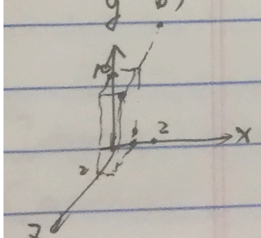
$\therefore B_1B' \parallel C_1C'$

& $\because B_1B'$, C_1C' lines intercept at O

$\therefore B_1B'$ is impossible to be parrallel to C_1C'

$\therefore$ The method is erroneous

b)



b)i. $\vec{v} = (2,10,-4) - (1,10,2)$ $\quad$ $\vec{v}$ is the direction of eye looking

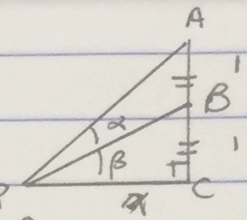
$\therefore \vec{v} = (1,0,-6)$

$\therefore P = (1,10,2) + t\vec{v}$

$= (1,10,2) + t(1,0,-6)$

$= (1+t,\ 10,\ 2-6t)$

ii. As C is in the middle of the image then PC is the line the camera directly looking to.



And $\angle APC \leq 45^\circ$ cas frustrum limit) and $\alpha < \beta$

$\because \therefore \angle PAC \geq 45^\circ \geq \angle APC$

Given than $AC = 2 = 2BC$, then $PC = x \geq 2$

$\therefore \tan\beta = \frac{BC}{PC} = \frac{1}{x}$

$\tan(\alpha+\beta) = \frac{AC}{PC} = \frac{2}{x}$

$\therefore \tan(2\beta) - \tan(\alpha+\beta)$

$= \frac{2\tan\beta}{1-\tan^2\beta} - \tan(\alpha+\beta)$

$= \frac{\frac{2}{x}}{1-\frac{1}{x^2}} - \frac{2}{x}$

$= \frac{2}{(x^2-1)x} > 0$

$\therefore \tan(2\beta) > \tan(\alpha+\beta)$

$\therefore 2\beta > \alpha+\beta$

$\therefore \beta > \alpha$

$\therefore \angle APB < \angle PBC$