

(b)  $F_1$ : manipulation

$$\bar{h}_2(s) = K_c \left(1 + \frac{1}{T_1 s}\right) \frac{\left(\frac{1/\alpha_2}{T_2 s + 1}\right)}{1 + K_c \left(1 + \frac{1}{T_1 s}\right) \left(\frac{1/\alpha_2}{T_2 s + 1}\right)} \cdot \bar{h}_{2, st}$$

$F_2$ : manipulation

$$\bar{h}_2(s) = K_c \left(1 + \frac{1}{T_1 s}\right) \frac{\left(\frac{1/\alpha_2}{T_2 s + 1}\right)}{1 + K_c \left(1 + \frac{1}{T_1 s}\right) \left(\frac{1/\alpha_2}{T_2 s + 1}\right)} \cdot \bar{h}_{2, st}(s)$$

$F_3$ : manipulation

$$\bar{h}_2(s) = \frac{K_c \left(1 + \frac{1}{T_2 s}\right)^{-1}}{1 + K_c \left(1 + \frac{1}{T_1 s}\right)^{-1} A_2 s} \cdot \bar{h}_{2, st}(s) + \frac{1}{1 + K_c \left(1 + \frac{1}{T_2 s}\right)^{-1} A_2 s}$$

(c) Set  $s \rightarrow 0$

$F_1$ :	manipulation	:	closed loop gain = 1
$F_2$ :	"	:	" " = 1
$F_3$ :	"	:	" " $1/\alpha_2 \cdot h_{2, st}(s) \approx 1$
"	"	:	" " $h_{2, st}(s) = 0$

(d) for the cases of  $F_1$  or  $F_2$  as manipulation we have only GSP.

for the case of  $F_3$ :