

Second Midterm Exam

1)

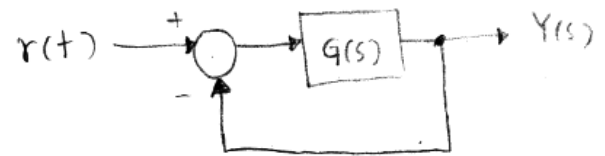
$$G(s) = \frac{1}{s(s+1)} \quad \triangleright \quad sG(s) = \frac{1}{(s+1)} \quad \triangleright \quad sG(0) = \frac{1}{(0+1)} = 1$$

$sG(0) = 1$ This is type 1 system

Input $r(t) = 2t$: this is a ramp input. $r(t) = At$

where $A = 2$

Ramp input $R(s) = \frac{A}{s^2}$



$$e_{ss} = \frac{A}{K_v} \quad \text{--- (1)}$$

Where $K_v = \lim_{s \rightarrow 0} sG(s)$

$$K_v = \lim_{s \rightarrow 0} s \frac{1}{s(s+1)} = 1$$

Sub. K_v into eq. (1)

$$e_{ss} = \frac{2}{1} = 2$$

$$e = r - y > 0$$

Therefore $Y(s)$ is less than $r(t)$

