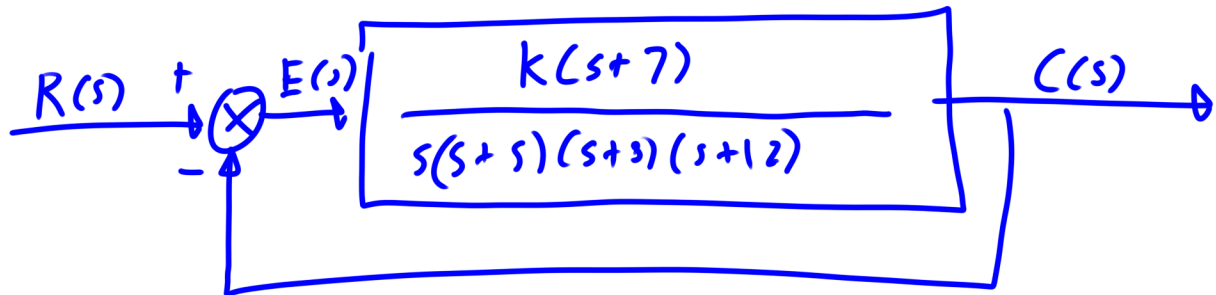


Nise 7.18



- a) what k ss position error 0.01 for input $\frac{1}{10}t$
- b) given k from part a find K_v
- c) what is the minimum possible ss error

$$e(\infty) = 0.01$$

$$\frac{1}{K_v} = 0.1$$

$$K_v = \frac{1}{0.1} = 10$$

$$\frac{1}{K_v} = e(\infty)$$

$$e_1(\infty) = 0.01$$

$$u_1(t) = 0.1 + u_2(t)$$

$$u_2(t) = t u_3(t)$$

$$e_2(\infty) = 0.1$$

$$\lim_{s \rightarrow 0} s G(s) = \lim_{s \rightarrow 0} \frac{k \cancel{s}(s+7)}{\cancel{s}(s+5)(s+3)(s+12)}$$

$$= \frac{k7}{5 \cdot 3 \cdot 12} = \frac{7k}{480} = K_v = 10$$

$$k = \frac{480(10)}{7} = \boxed{686}$$

$$K_v = \frac{7k}{480}$$

minimum ss error
at largest possible
 k