$$T_a(s) = -\frac{10}{s}$$

$$T_i(s) = \left(\frac{1}{1000s+3}\right)\left(-\frac{10}{s}\right)$$ } one pole @ 0, otherwise stable

F.V.T.: $\lim_{t\to\infty} T_i(t) = \lim_{s\to 0} s\,T_i(s)$

$$= \lim_{s\to 0} \frac{-10}{1000s+3}$$

$$= \boxed{-\frac{10}{3}}$$