

Control Systems for Machine Tools
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Knowledge Test - Questions

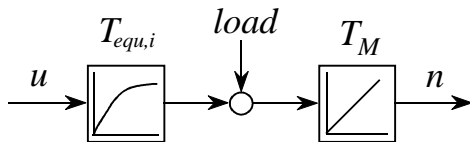
1. Given: a vector $\vec{P}(u)$, where u is a function of s : $u = u(s)$.

Derive $\frac{d\vec{P}}{ds}$ applying the chain rule.

2. Given: vector $\vec{a} = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$ and vector $\vec{b} = \begin{bmatrix} 0 \\ -1 \\ 0 \end{bmatrix}$.

Compute vector and cross product.

3. Given: controlled system shown below.



Set up its transfer function $F(s) = \frac{n(s)}{u(s)}$.

4. Complete the above controlled system to get a closed control loop with a Proportional-Integral-Controller. What is the purpose of the integral part of the controller ?