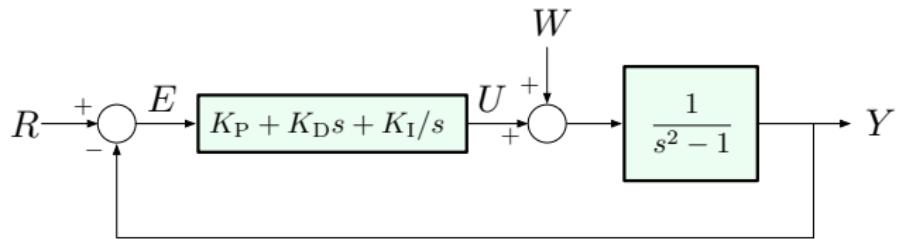


# Proportional-Integral-Derivative (PID) Control



$$(s^3 - s + K_P s + K_D s^2 + K_I) Y = (K_P s + K_D s^2 + K_I) R + W s$$

Therefore,

$$Y = \frac{K_D s^2 + K_P s + K_I}{s^3 + K_D s^2 + (K_P - 1)s + K_I} R + \frac{s}{s^3 + K_D s^2 + (K_P - 1)s + K_I} W$$