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% Presenting and simplifying transfer function
%  $G_c(s)G_p(s) / (1 + G_c(s)G_p(s)H(s))$ 
% where  $G_p(s) = 45.673 / (s/4.45 + 1)(s/9.35 + 1)$ 
% and  $H(s) = 1 / (0.05s + 1)$ 
% and  $G_c(s)$  is the PI controller
s = tf('s');
Gc = 0.1;
Gp = 45.673 / (((s / 4.45) + 1) * ((s / 9.35) + 1));
H = 1 / (0.05 * s + 1);

Cltf = (Gc * Gp) / (1 + (Gc * Gp * H));
Cltf_simplified = minreal(Cltf);

% Part b: Using a step input of Wref = 100rad/s

step(100 * Cltf_simplified);
step_input_data = stepinfo(100 * Cltf_simplified);

% Part c: Programming the PI controller
Gc = 0.5 + (0.5 * s);
Cltf = (Gc * Gp) / (1 + (Gc * Gp * H));
step(100 * Cltf);

```

