



UNIVERSIDAD FIDELITAS

Escuela de Ingeniería Eléctrica

Control automático

Tarea#6

Error estacionario para una entrada escalon.

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Parte en matlab:

```
>> num=[0 0 0 1]
```

```
num =
```

```
0 0 0 1
```

```
>> den=[1 5 6 0]
```

```
den =
```

```
1 5 6 0
```

```
>> A=tf(num,den)
```

```
A =
```

```
1
```

$s^3 + 5s^2 + 6s$

Continuous-time transfer function.

```
>> H=1
```

```
H =
```

```
1
```

```
>> W=feedback(A,H)
```

```
W =
```

```
1
```

$s^3 + 5s^2 + 6s + 1$

Continuous-time transfer function.

```
>> P=feedback(1,W)
```

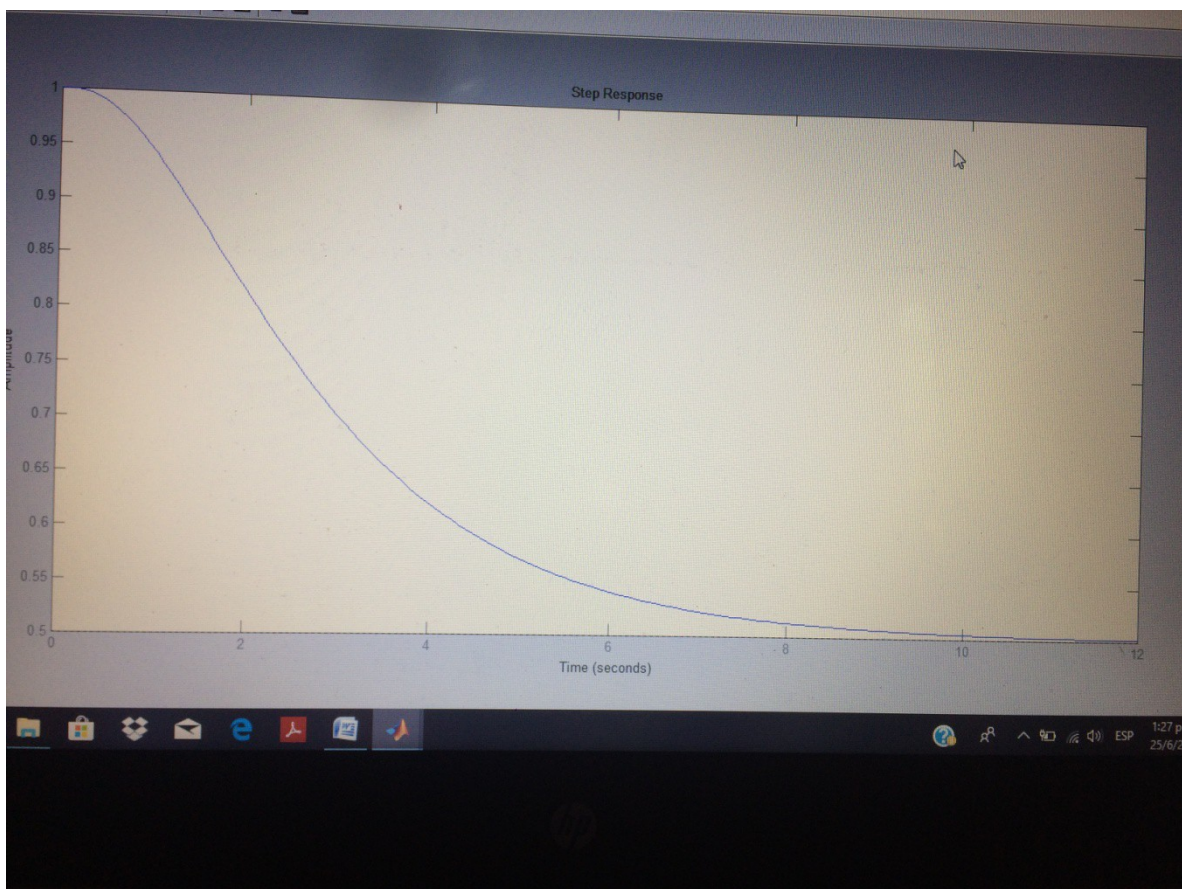
P =

$$s^3 + 5 s^2 + 6 s + 1$$

$$s^3 + 5 s^2 + 6 s + 2$$

Continuous-time transfer function.

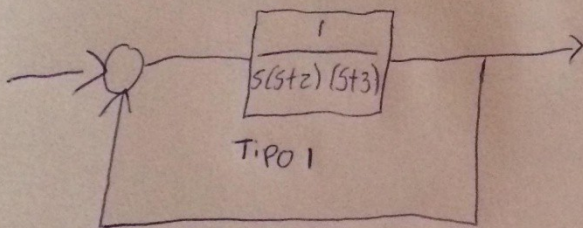
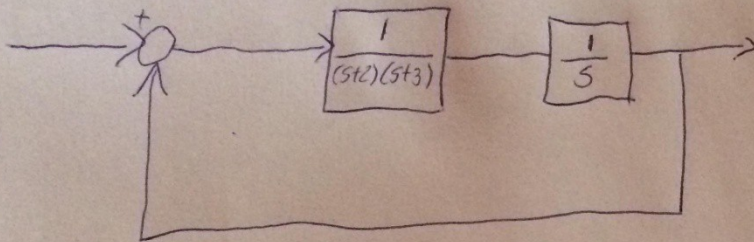
```
>> step(P)
```



Parte a mano:

$$ess = \lim_{s \rightarrow 0} \left[\frac{1}{1 + \frac{1}{s(s+2)(s+3)}} \cdot \frac{1}{s} \right] \Rightarrow \frac{s(s+2)(s+3)}{s(s+2)(s+3)+1} \Rightarrow \frac{s(s+2)(s+3)}{s(s+2)(s+3)+1}$$

$$\Rightarrow \frac{0(0+2)(0+3)}{0(0+2)(0+3)+1} = \frac{0}{0+1} \Rightarrow \frac{0}{1} = 0$$



Segun la tabla error estado estacionario

Sistema Tipo	Entrada escalon
0	$\frac{1}{1+K}$
1	0
2	0