



UNIVERSIDAD FIDELITAS

Escuela de Ingeniería Eléctrica

Control automático

Tarea#3

Ajuste de lazo para asegurar estabilidad

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Parte hecha en matlab:

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

```
num =
```

```
0    0    1    0
```

```
>> den=[1 4 4 0]
```

```
den =
```

```
1    4    4    0
```

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

```
A =
```

```
s
```

```
-----
```

```
s^3 + 4 s^2 + 4 s
```

Continuous-time transfer function.

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

```
num =
```

```
0    1    0
```

```
>> den=[1 2 0]
```

```
den =
```

```
1    2    0
```

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

```
B =
```

```
s
```

```
-----
```

```
s^2 + 2 s
```

Continuous-time transfer function.

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

W =

$$s^3 + 2 s^2$$

$$s^5 + 6 s^4 + 12 s^3 + 9 s^2$$

Continuous-time transfer function.

```
>> num=[0 0 1 2 0 0]
```

num =

$$0 \quad 0 \quad 1 \quad 2 \quad 0 \quad 0$$

```
>> den=[1 6 12 9 0 0]
```

den =

$$1 \quad 6 \quad 12 \quad 9 \quad 0 \quad 0$$

```
>> [Z,P,K]=tf2zp(num,den)
```

Z =

$$0$$

$$0$$

$$-2$$

P =

$$0.0000 + 0.0000i$$

$$0.0000 + 0.0000i$$

$$-3.0000 + 0.0000i$$

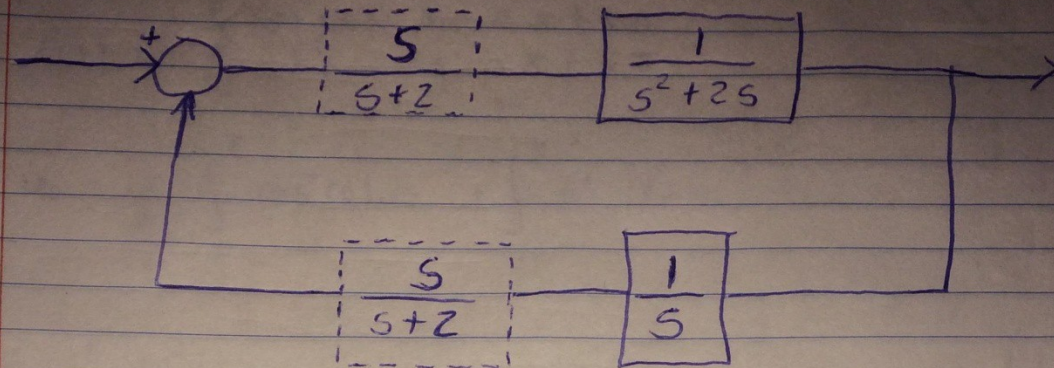
$$-1.5000 + 0.8660i$$

$$-1.5000 - 0.8660i$$

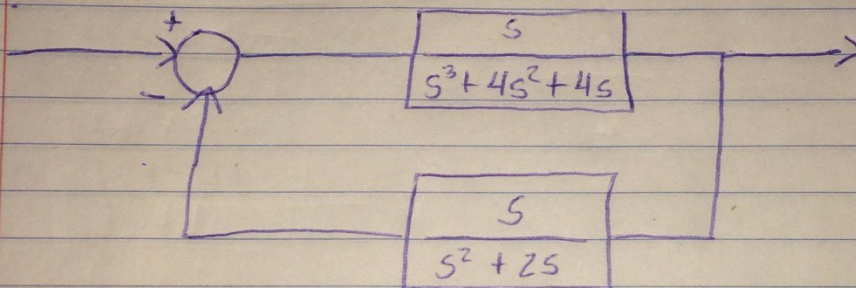
K =

$$1$$

Parte hecha a mano:



⇓ Soq bloques en serie :.



Feedback \approx

$$\frac{s^3 + 2s^2}{s^5 + 6s^4 + 12s^3 + 9s^2}$$

$Z = \text{zeros} = 0, 0, -2$

$K = 1$

$P = \text{Poles}$

$0,0000 + 0,0000i$
 $0,0000 + 0,0000i$
 $-3,0000 + 0,0000i$
 $-1,5000 + 0,8660i$
 $-1,5000 - 0,8660i$

Step(W)

