

MATLAB Exercise

- The MATLAB command **tf** can be used to construct a transfer function.

e.g.

```
num = [10]
```

```
den = [1 2 10]
```

```
F = tf(num, den)
```

We can use many MATLAB functions to handle the transfer function we just created. For instance, **stepplot** will plot the step response.

e.g.

```
stepplot(F)
```

- We can convert between polynomial form and factored form for a given transfer function using the following MATLAB functions.

zp2tf - factored form to polynomial form

tf2zp - polynomial form to factored form

e.g.

```
numz = [-2 -4]
```

```
denp = [0 -3 -5]
```

```
k = 10
```

```
[num, den] = zp2tf(numz', denp', k)
```

```
tf(num,den)
```

```
[numz_, denp_] = tf2zp(num,den)
```

- Plot the step response for a system whose transfer function is given by

$$\frac{20}{3s^2 + 8s + 20}$$

- Find the factored form of the transfer function

$$\frac{11s^2 + 88s + 165}{s^3 + 9s^2 + 14s}$$