```
J = 1;
Bearings = 0.6;
K = 9;
```

```
A = [-Bearings / J, 1 / J; -K, 0]
```

```
A = 2×2
   -0.6000    1.0000
   -9.0000         0
```

```
B = [0; K]
```

```
B = 2×1
     0
     9
```

```
[M, D] = eig(A)
```

```
M = 2×2 complex
   0.0316 - 0.3146i   0.0316 + 0.3146i
   0.9487 + 0.0000i   0.9487 + 0.0000i
D = 2×2 complex
  -0.3000 + 2.9850i   0.0000 + 0.0000i
   0.0000 + 0.0000i  -0.3000 - 2.9850i
```

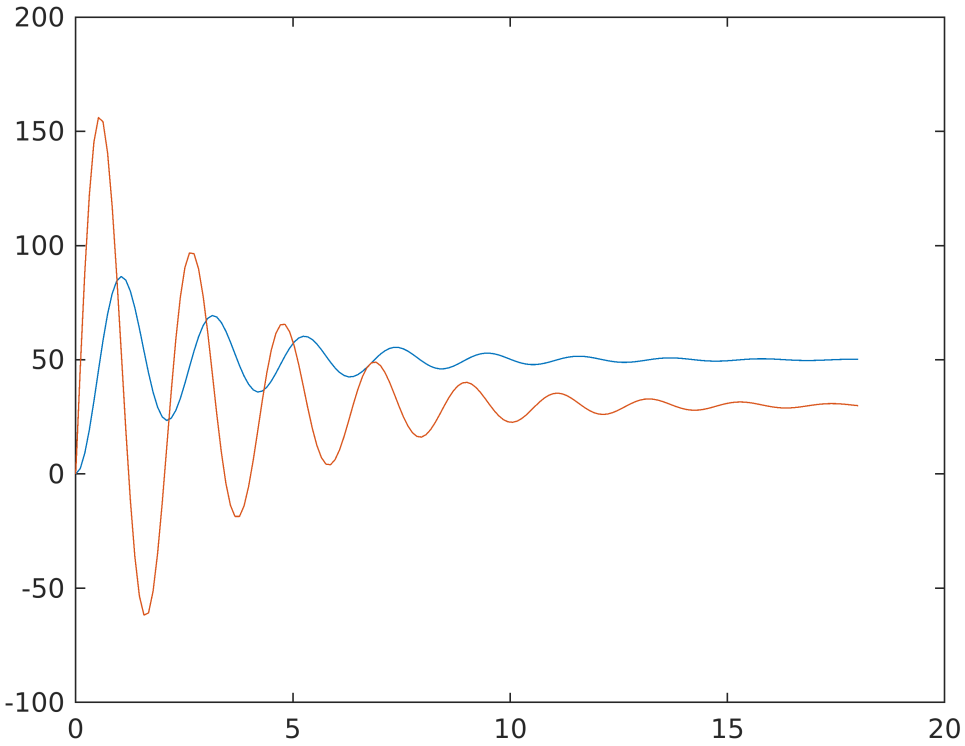
```
dt = 0.2;
Phi = M * diag(exp(diag(D) * dt)) * inv(M)
```

```
Phi = 2×2 complex
   0.7257 - 0.0000i   0.1774 - 0.0000i
  -1.5963 - 0.0000i   0.8321 + 0.0000i
```

```
u = 50;
x_fo = @(t) sum(Phi^(0:dt:t / dt) * B * u, 2);
```

```
```

```
sys = ss(A, B, eye(2), [0; 0]);
[x, t] = step(sys);
plot(t, 50 * x)
```



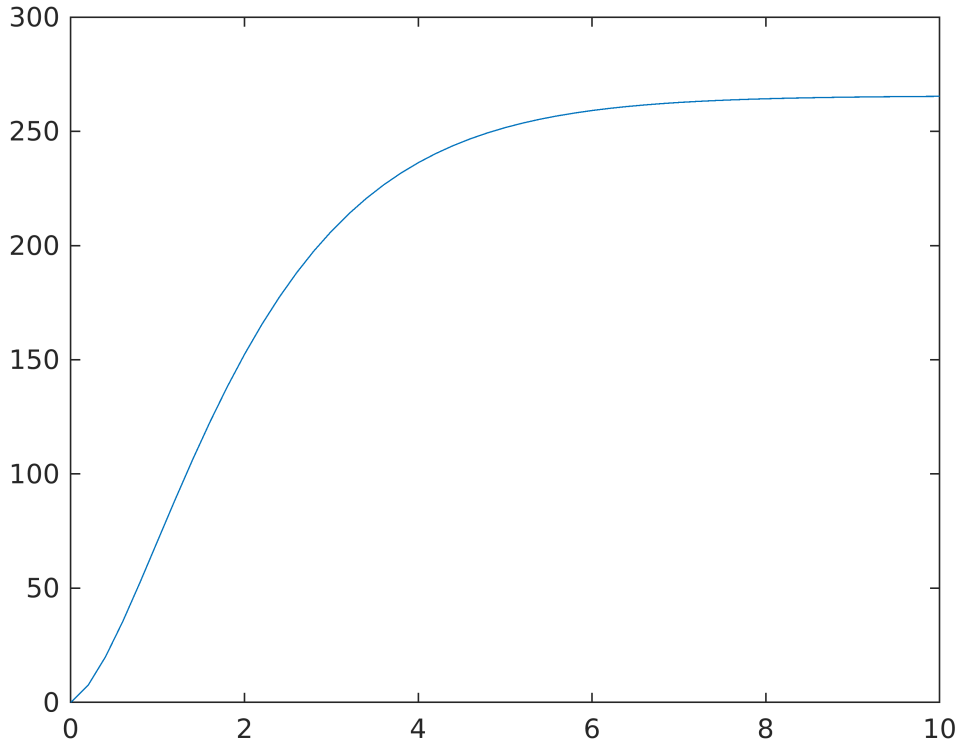

```
u = @(t) 5 * t;
```

```
t_vec = reshape(0:dt:10, 1, 1, []);
x_fo = reshape(cumsum(pagemtimes(pagemtimes(Phi.^(t_vec / dt), B), u(t_vec)), 3), 2, []
```

```
x_fo = 2×51 complex
10^2 ×
   0.0000 + 0.0000i   0.0160 - 0.0000i   0.0216 - 0.0000i   0.0231 - 0.0000i ···
   0.0000 + 0.0000i   0.0749 + 0.0000i   0.1995 + 0.0000i   0.3551 + 0.0000i
```

```
plot(reshape(t_vec, 1, []) , x_fo(2,:))
```

```
Warning: Imaginary parts of complex X and/or Y arguments ignored.
```

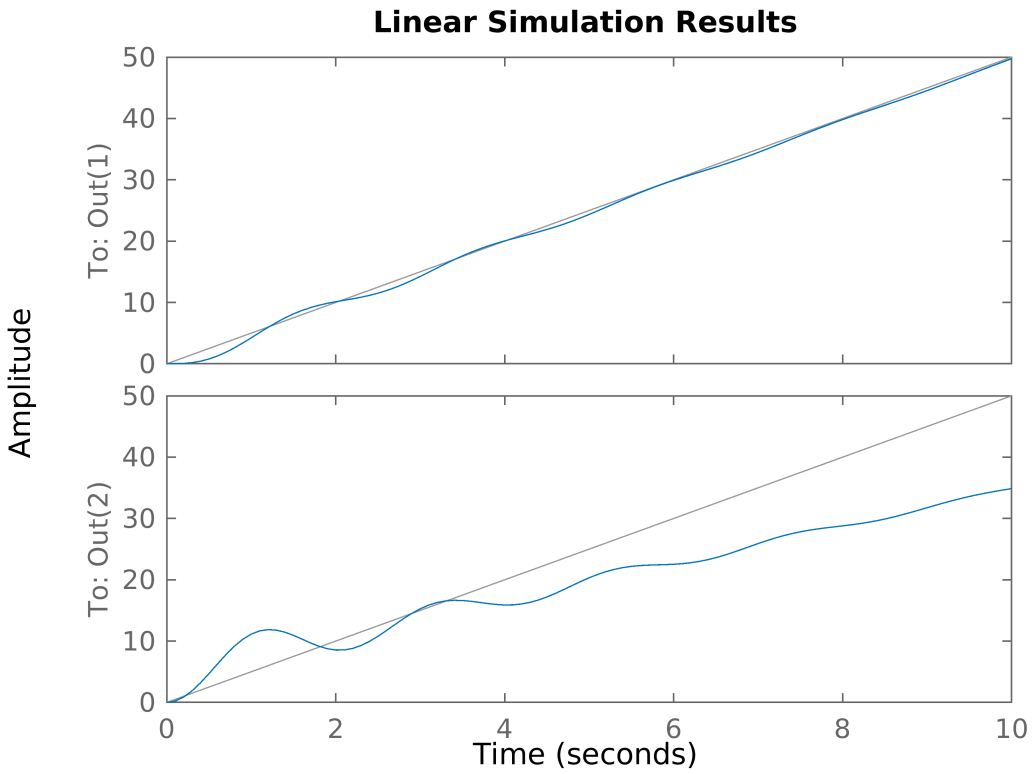



```
Unrecognized function or variable 'ramp'.
```

```
t = 0:0.1:10
```

```
t = 1×101
         0    0.1000    0.2000    0.3000    0.4000    0.5000    0.6000    0.7000 ···
```

```
lsim(sys, 5 * t, t)
```


Linear Simulation Results
Amplitude
To: Out(1)
To: Out(2)
0
10
20
30
40
50
0
2
4
6
8
10
Time (seconds)