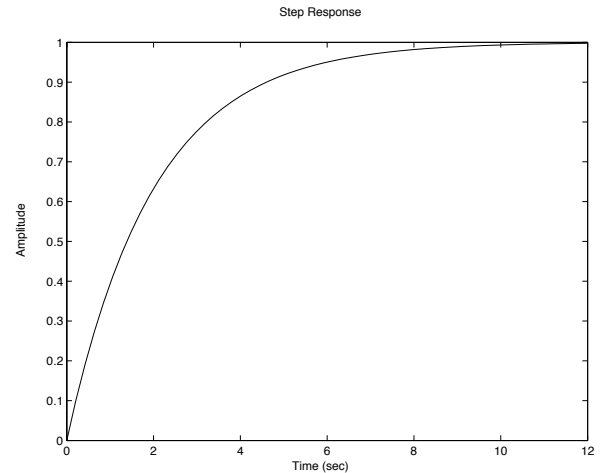
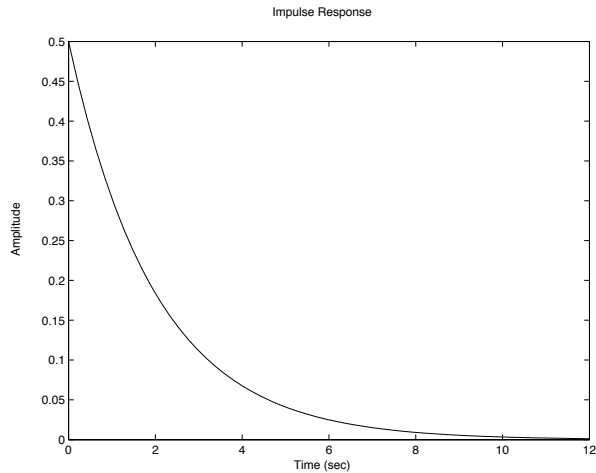


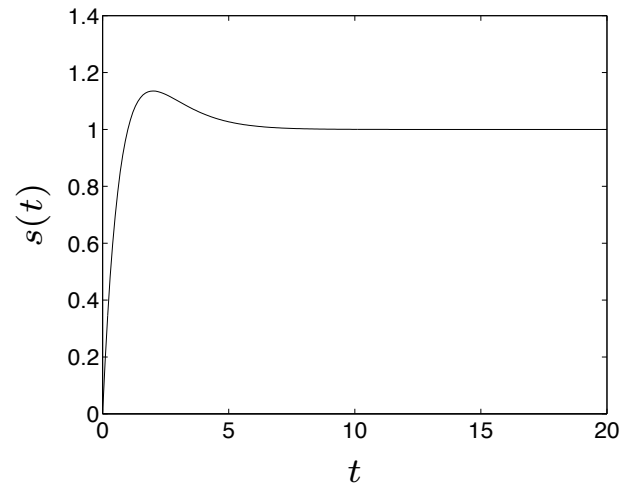
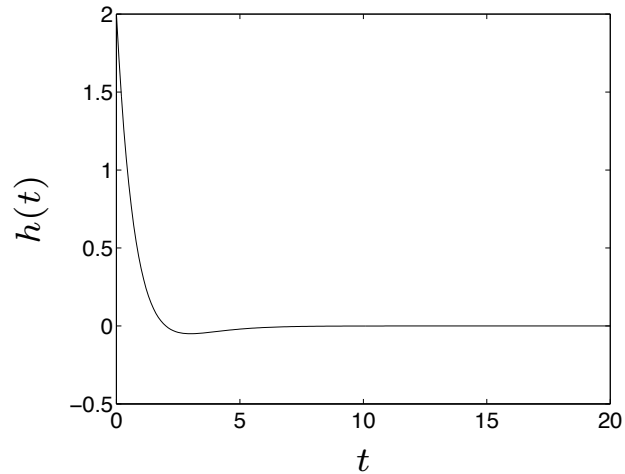
3(a) MATLAB code and output are as follows.

```
R = 2;  
C = 1;  
lhs = [R*C,1];  
rhs = [1];  
G = tf(rhs,lhs);  
figure  
impz(G);  
figure  
step(G);
```



3(b) MATLAB code and output are as follows.

```
k = 1;  
b = 2;  
m = 1;  
  
lhs = [m,b,k];  
rhs = [b,k];  
  
G = tf(rhs,lhs);  
t = 0:0.01:20;  
  
figure  
impulse(G,t);  
  
figure  
step(G,t);
```



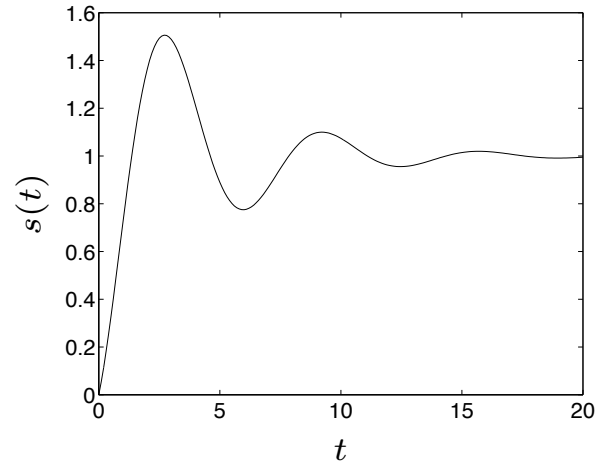
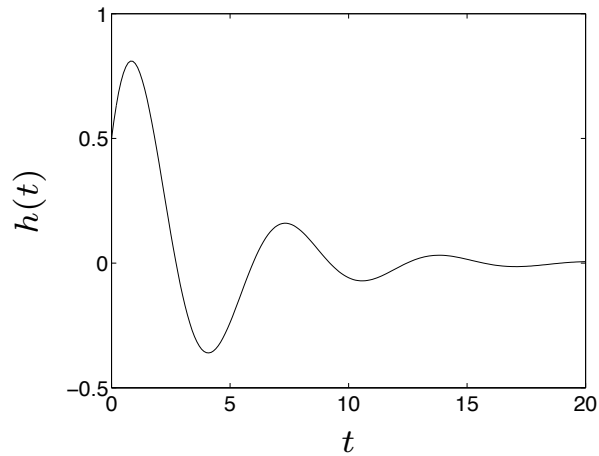
3(c) MATLAB code and output are as follows.

```
k = 1;
b = 0.5;
m = 1;

lhs = [m,b,k];
rhs = [b,k];
G = tf(rhs,lhs);
t = 0:0.01:20;

figure
impulse(G,t);

figure
step(G,t);
```



As the amount of damping decreases, the oscillations last longer.

3(d) MATLAB code and output are as follows.

```
k = 1;  
b = 0.5;  
m = 1;  
lhs = [m,b,k];  
rhs = [b,k];  
G = tf(rhs,lhs);  
t = 0:0.01:20;  
f = exp(-t/5) .* cos(2*t);  
figure  
lsim(G,f,t);
```

