

## Bonus Question

### Periodic signals

1.  $x[n] = \cos(1.2\pi n)$
2.  $y(t) = \cos(2t - \pi)$
3.  $y[n] = \cos(2n - \pi)$
4.  $z[n] = (-1)^n$

### Aperiodic signals

1.  $x(t) = \cos(1.2\pi t)u(t)$
2.  $z(t) = e^{-t} \cos(2t)$

```
In [ ]: %matplotlib inline
import matplotlib.pyplot as plt
import math
import numpy as np

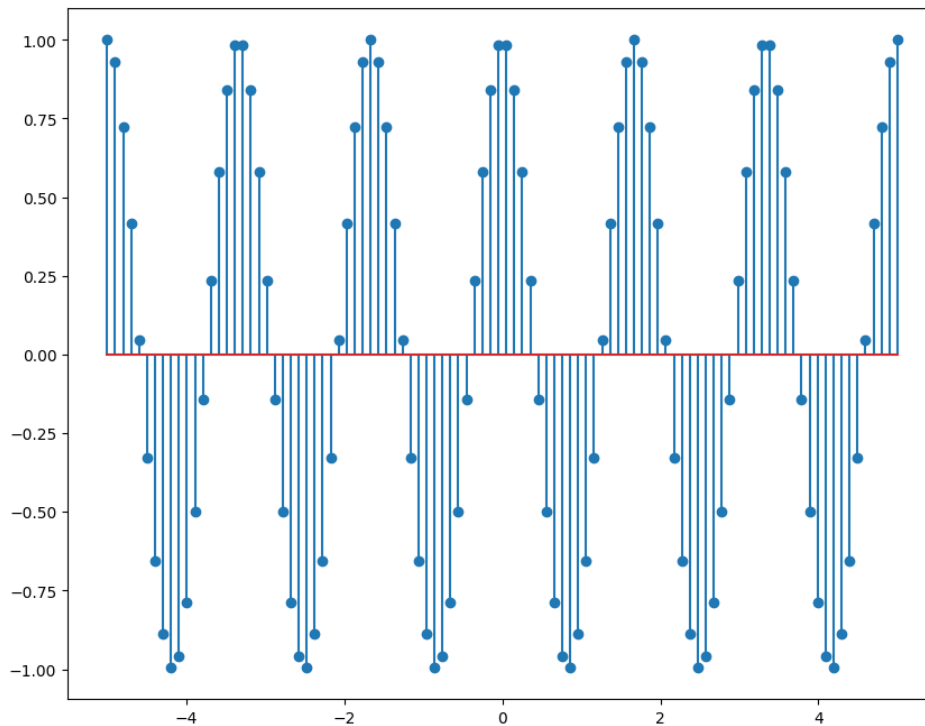
n = np.linspace(-5, 5, 100)
```

```
x[n] = cos(1.2*np.pi*n)
```

```
In [ ]: x1 = np.cos(1.2 * np.pi * n)

plt.figure(figsize=(10, 8))
plt.stem(n, x1)
```

```
Out[ ]: <StemContainer object of 3 artists>
```

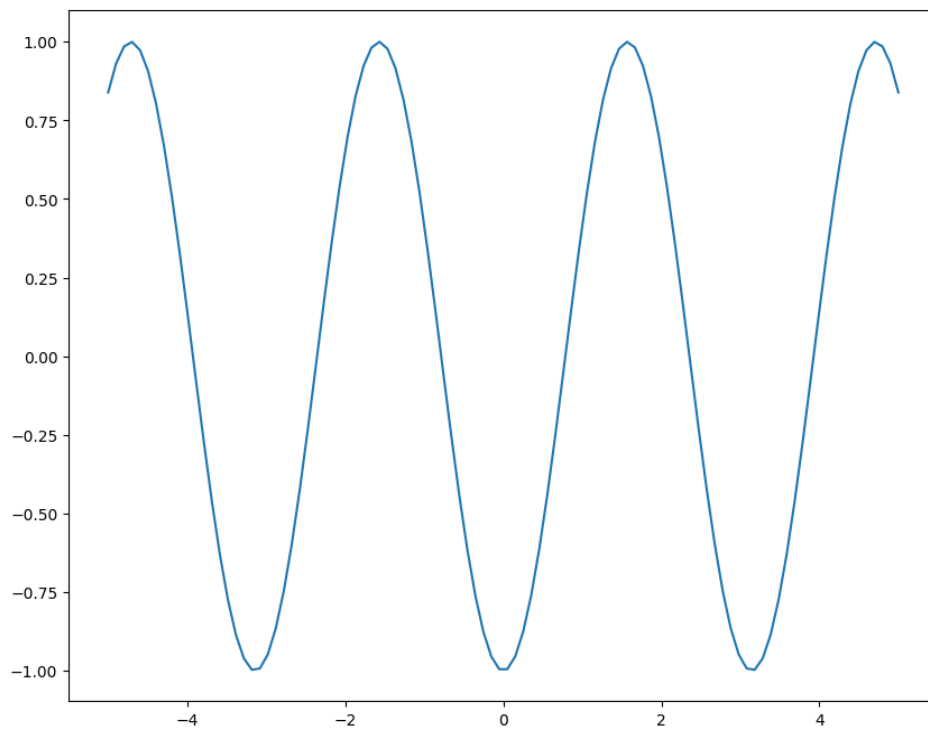


$y(t) = \cos(2t - \pi)$

```
In [ ]: y1 = np.cos(2 * n - np.pi)

plt.figure(figsize=(10, 8))
plt.plot(n, y1)
```

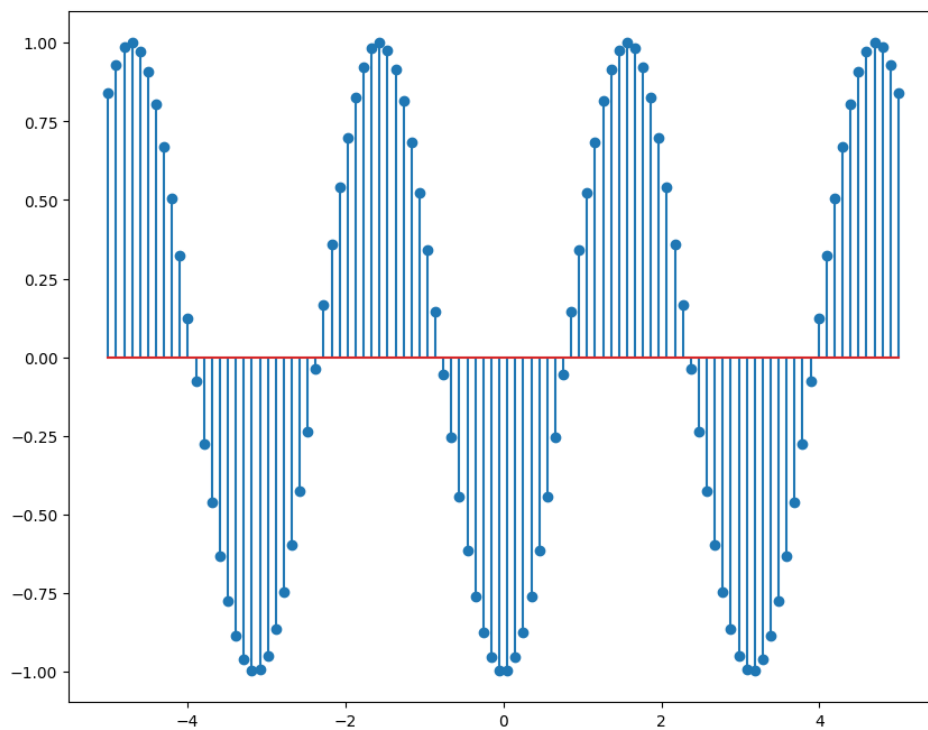
```
Out[ ]: [<matplotlib.lines.Line2D at 0x14d6def50>]
```



$$y[n] = \cos(2n - \pi)$$

```
In [ ]: y2 = np.cos(2 * n - np.pi)
plt.figure(figsize=(10, 8))
plt.stem(n, y2)
```

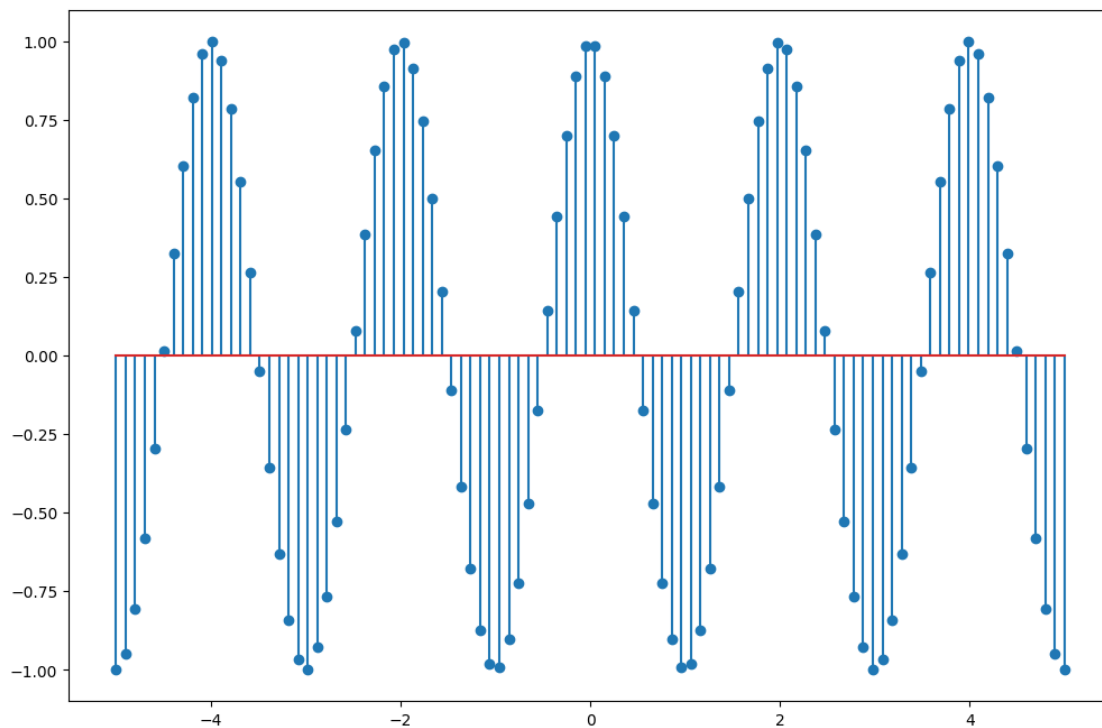
```
Out[ ]: <StemContainer object of 3 artists>
```



$$z[n] = (-1)^n$$

```
In [ ]: n1 = np.linspace(-10, 10, 1000)
z1 = np.power(-1, n + 0j)
plt.figure(figsize=(12, 8))
plt.stem(n, z1)
```

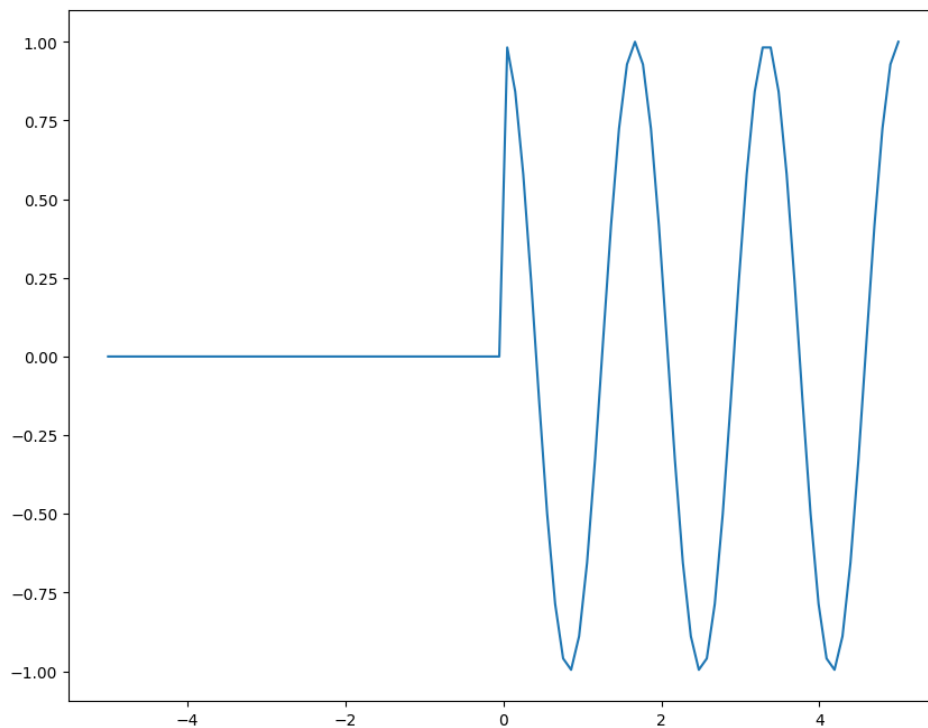
```
Out[ ]: <StemContainer object of 3 artists>
```



$$x(t) = \cos(1.2\pi t)u(t)$$

```
In [ ]: u = np.heaviside(n, 1)
x2 = np.cos(1.2 * np.pi * n) * u
plt.figure(figsize=(10, 8))
plt.plot(n, x2)
```

Out[ ]: [<matplotlib.lines.Line2D at 0x14d8868d0>]



$$z(t) = e^{-t} \cos(2t)$$

```
In [ ]: z2 = np.e ** (-n) * np.cos(2 * n)
plt.figure(figsize=(10, 8))
plt.plot(n, z2)
```

Out[ ]: [<matplotlib.lines.Line2D at 0x14d8ee050>]

