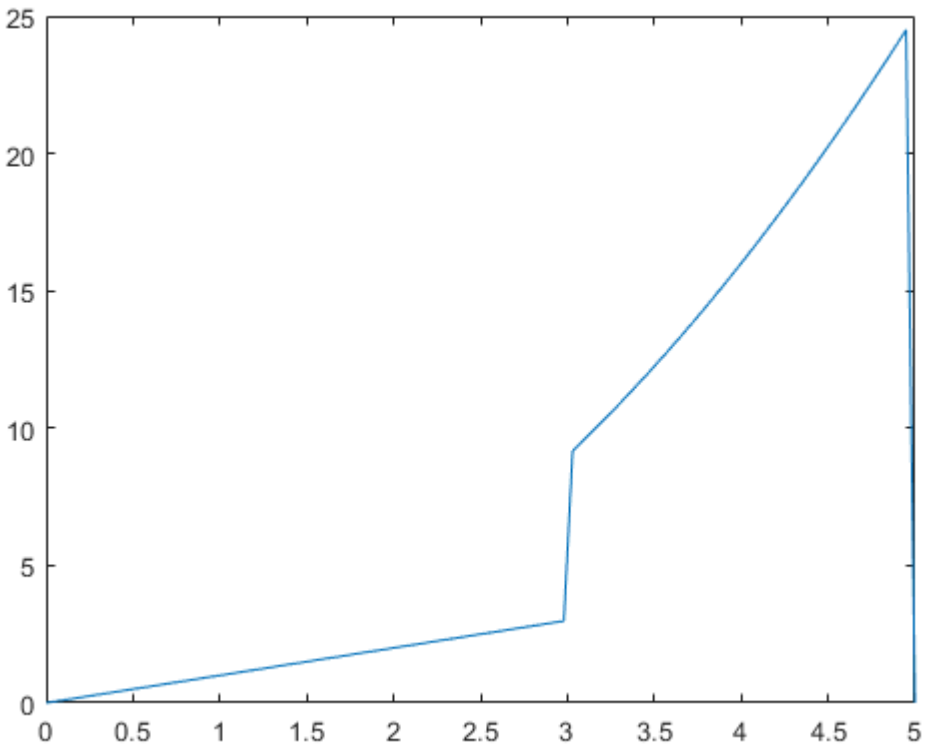
Q1

$$f(x) = \begin{cases} x & 0 \le x < 3 \\ x^2 & 3 \le x < 5 \end{cases}$$

```
f = @(x) x.*(0 <= x & x < 3) + (x.^2).*(3 <= x & x < 5)
```

```
f = function_handle with value:
    @(x)x.*(0<=x&x<3)+(x.^2).*(3<=x&x<5)
```

```
x = linspace(0, 5, 100);
y = f(x);
plot(x, y)
```



Plot the function in the interval [0, 15]

```
ncycle = (15-0)/(5-0)
```

```
ncycle = 3
```

```
y
```

```
y = 1×100
         0    0.0505    0.1010    0.1515    0.2020    0.2525    0.3030    0.3535 ···
```

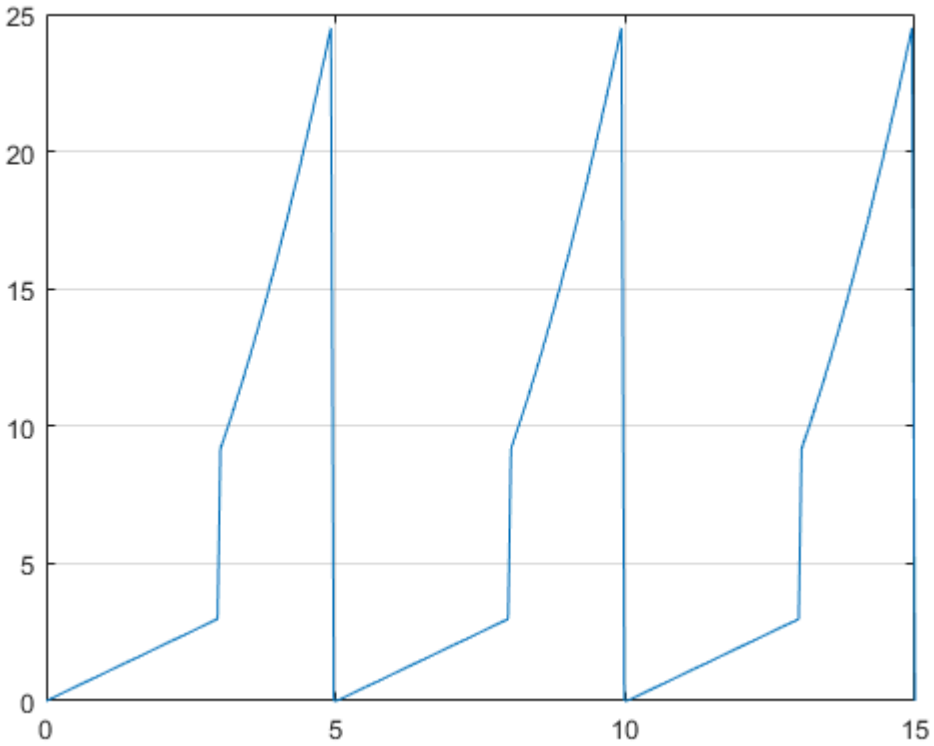
```
ry = repmat(y, 1, 3)
```

```
ry = 1×300
         0    0.0505    0.1010    0.1515    0.2020    0.2525    0.3030    0.3535 ···
```

```
rx = linspace(0, 15, length(ry))
```

```
rx = 1×300
         0    0.0502    0.1003    0.1505    0.2007    0.2508    0.3010    0.3512 ···
```

```
plot(rx, ry)
grid on
```



Q2

$$f(x) = \begin{cases} \frac{x^2}{4} & 0 \le x < 4 \\ 4 & 4 \le x < 6 \\ 0 & 6 \le x < 8 \end{cases} \quad f(x+8) = f(x)$$

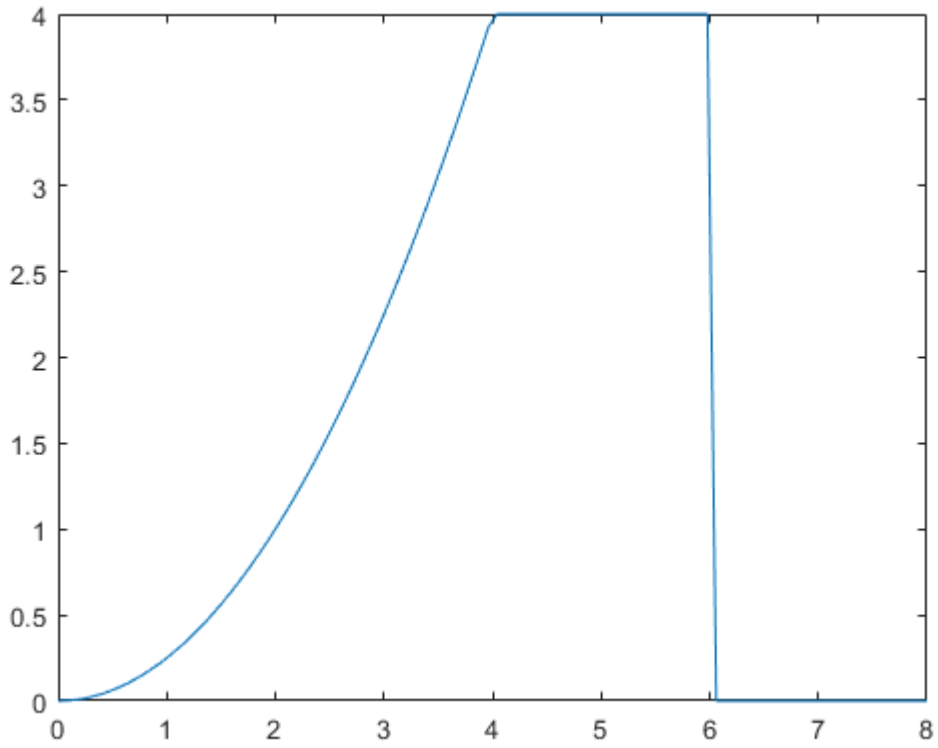
Period of the function = 8 = T

```
f = @(x) ((x.^2)/4).*(0<=x & x < 4) + 4.*(4<=x & x < 6) + 0.*(6 <= x & x < 8)
```

```
f = function_handle with value:
    @(x)((x.^2)/4).*(0<=x&x<4)+4.*(4<=x&x<6)+0.*(6<=x&x<8)
```

```
x = linspace(0, 8, 100); % since the function is periodic in interval 0 to 8, we insert 100 val
y = f(x); % evaluate the function in this interval

% sample plot in [0 8]
plot(x, y)
```



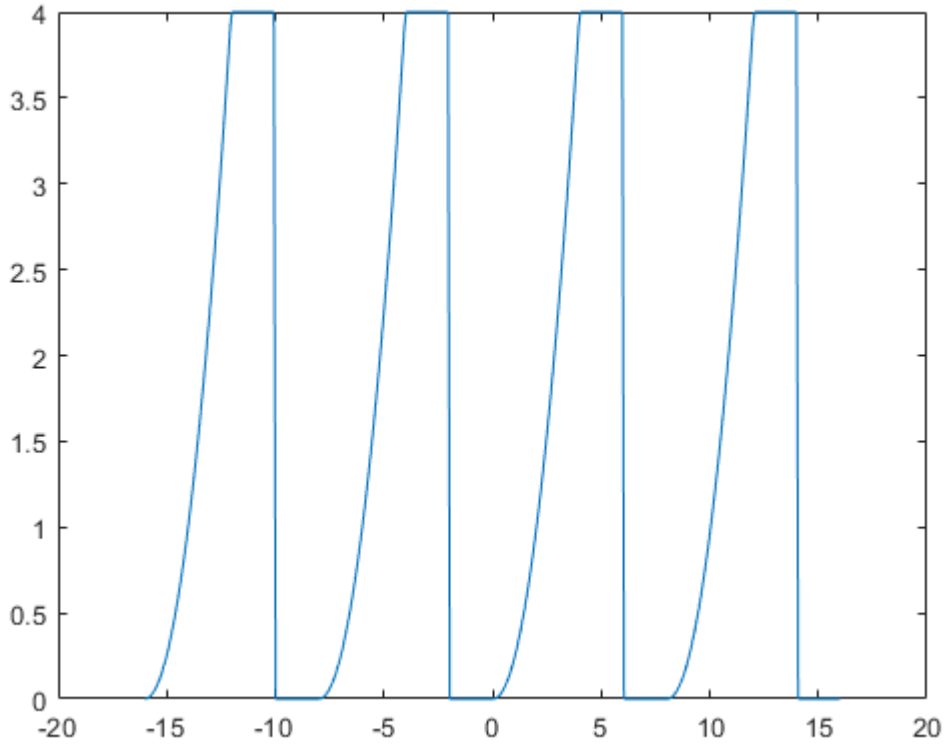
Now plot the function in the interval [-16 16]

ncycles = (16--16) / (8-0) = 4

```
ry = repmat(y, 1, 4);
rx = linspace(-16, 16, length(ry)) % linspace the new interval with the number of values insert
```

```
rx = 1×400
  -16.0000  -15.9198  -15.8396  -15.7594  -15.6792  -15.5990  -15.5188  -15.4386 ···
```

```
plot(rx, ry)
```


4
3.5
3
2.5
2
1.5
1
0.5
0
-20
-15
-10
-5
0
5
10
15
20