Periodic Functions
We say \( f(x) \) is periodic with period \( m \) if \( f(x) = f(x+m) \) for all \( x \).
Usually we are given a formula for \( f \) on a single period \([a,b]\) with \( b-a=m \).
To find \( f(x) \) for \( x \) not in \([a,b]\) we first find the greatest integer multiple of \( m \) less than or equal to \( x-a \),

\[ z = m \cdot \text{floor}((x-a)/m) \]

(Here \( \text{floor}(t) \) is the MATLAB function giving the greatest integer \( \leq t \).)
Now \( y = x - z \) is in \([a,b]\). The point is that \( f(y) = f(x) \) and we have a formula for \( f(y) \).

example
Let \( f(x) = \text{abs}(x) \) for \(-3 \leq x < 3\) and assume \( f(x) \) is \( 3-(-3) = 6 \)-periodic.
To write a M-file for \( f \) type:

```
function w = f(x)
z = 6 * \text{floor}((x+3)/6);
y = x - z;
w = \text{abs}(y);
```

ASSIGNMENT 3:
1. Let
   \( f(x) = x^2 \) if \(-2 \leq x < 2\) 
   and \( f(x) \) is 4-periodic.
   Write \( f.m \) and graph \( f(x) \) on \([-10,10]\).

2. Let
   \( g(x) = x \) if \(-2 \leq x < 2\) 
   and \( g(x) \) is 4-periodic.
   Write \( g.m \) and graph \( g(x) \) on \([-10,10]\).