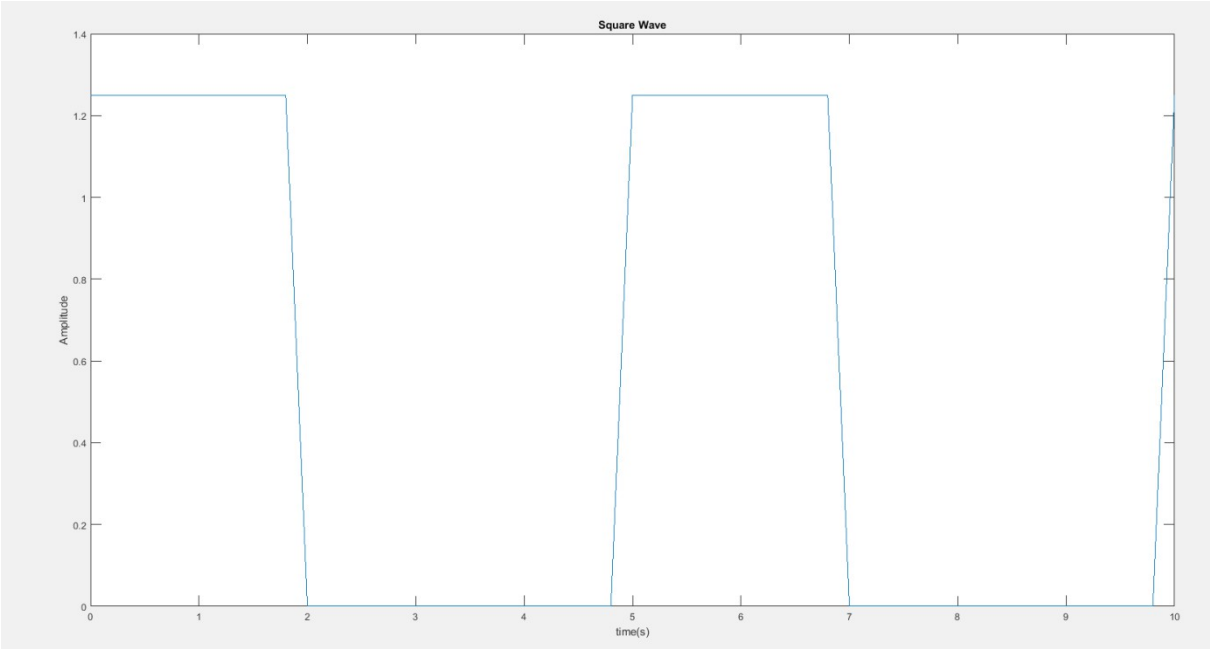
CAHW#2

a)

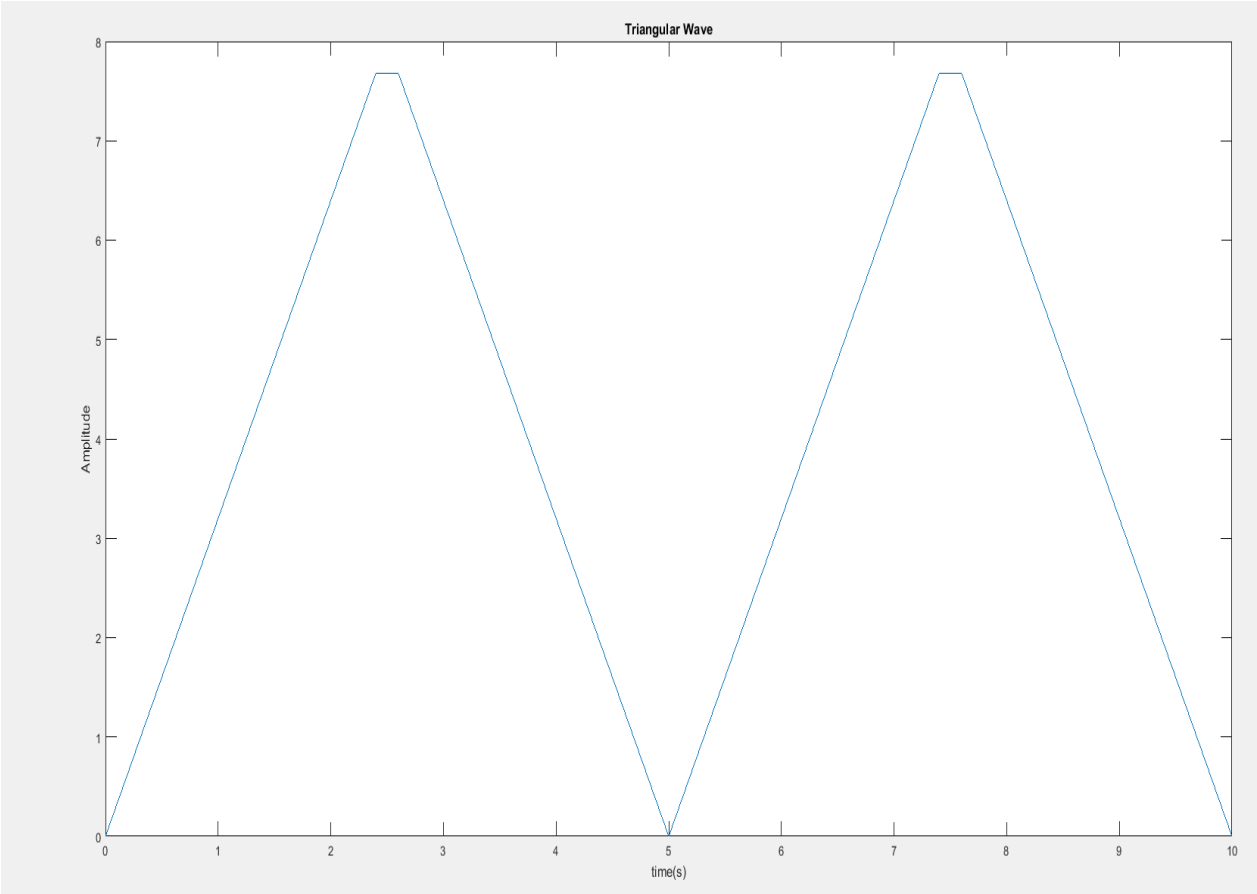
i) Square Wave:

```
>> t = 0:0.2:10;
>> y =  1.25/2*(square(0.4*pi*t,40)+1);
>> plot(t,y)
>> xlabel('time(s)');
>> ylabel('Amplitude');
>> title('Square Wave')
```



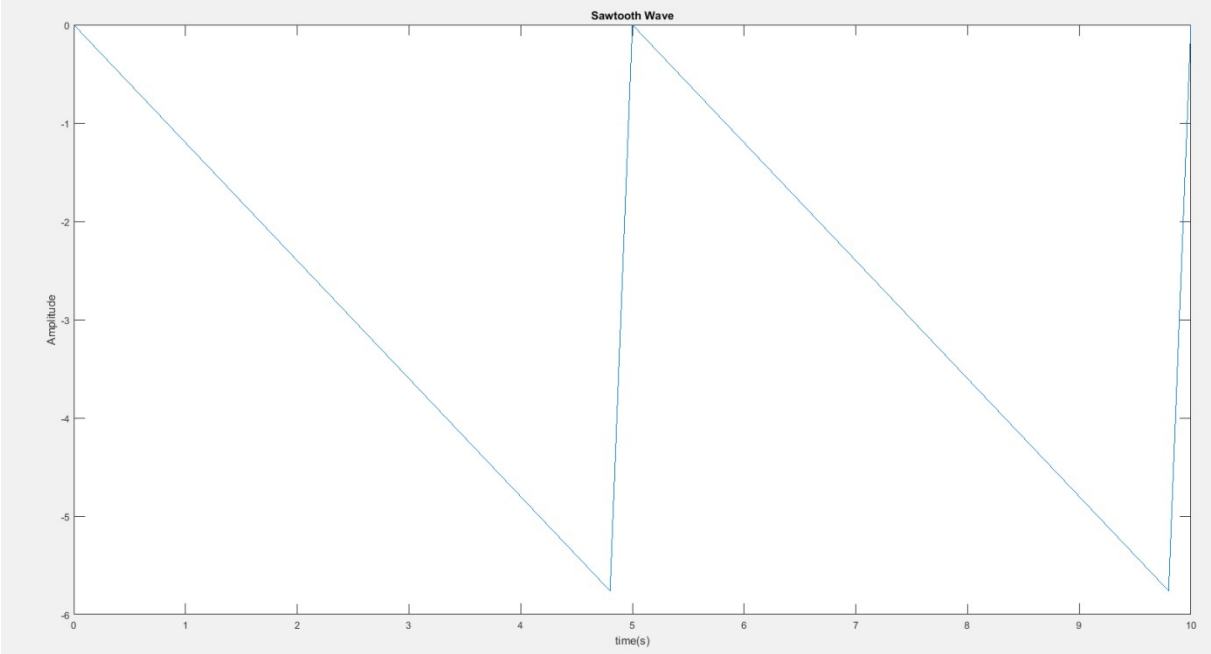
ii) Triangular:

```
>> t = 0:.2:10;
>> y = sawtooth(2*pi*.2*t,.5);
>> y = y +1;
>> y = y*4;
>> plot(t,y)
>> xlabel('time(s)');
>> ylabel('Amplitude');
>> title('Triangular Wave')
```



iii) Sawtooth:

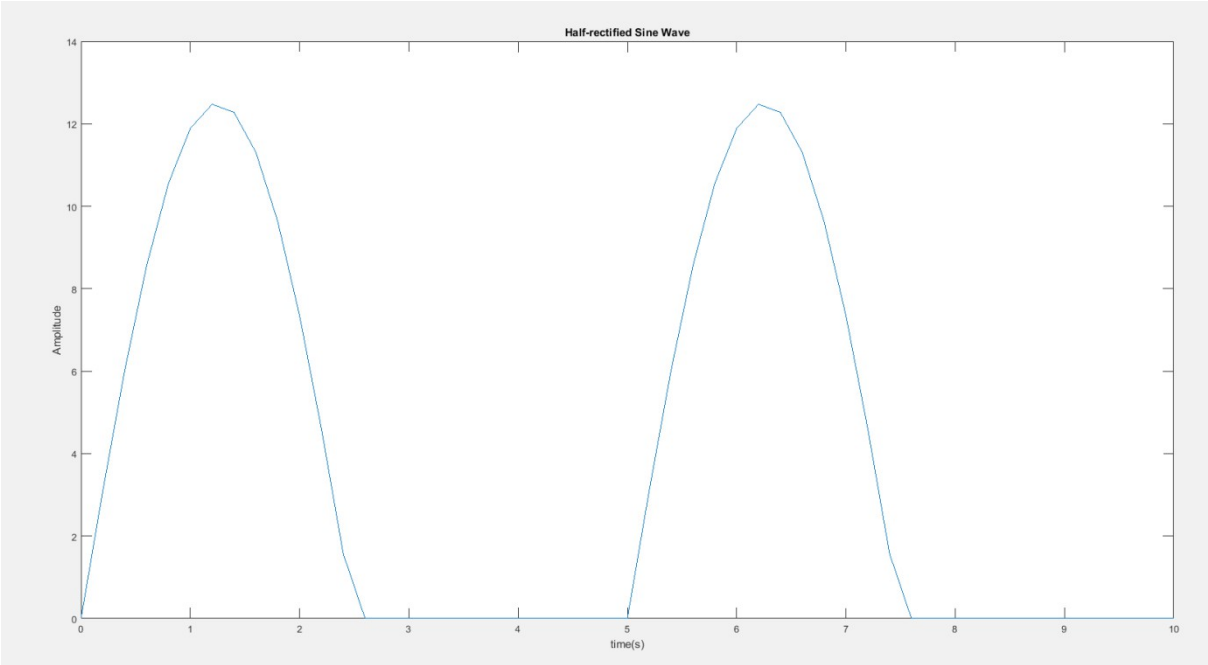
```
>> t = 0:.2:10;
>> y = -3*(sawtooth(2*pi*.2*t) + 1);
>> plot(t,y)
>> xlabel('time(s)');
>> ylabel('Amplitude');
>> title('Sawtooth Wave')
```



iv) Half-rectified Sine:

```
function [ x ] = rectifiedSineWave( t)
     x = max(0, sin(t));
end
```

```
>> t = 0:0.2:10;

>> y = rectifiedSineWave(2*pi*.2*t);

>> y = y*12.5;

>> plot(t,y)

>> xlabel('time(s)');

>> ylabel('Amplitude');

>> title('Half-Rectified-Sine-Wave')
```



c)

i) Square Wave:

```
function [ ss ] = sSquare( t,x )

    n = -x;
    ss = 0;
    j = sqrt(-1);
    ex = exp(1);
    for n : 0
        ss += ((5-5*power(ex,(-   4/5)*pi*j*n)))/
(8*pi*j*n)*(power(ex,2*pi*n*(1/5)*t));
        n = n + 1;
    end
    n = n + 1;
    for n : x
        ss += ((5-5*power(ex,(-4/5)*pi*j*n)))/
(8*pi*j*n)*(power(ex,2*pi*n*(1/5)*t));
        n = n + 1;
    end
end
```

ii) Triangular Wave:

```
function [ st ] = sTriangular( t,x )
    n = -x;
    st = 0;
    j = sqrt(-1);
    ex = exp(1);
    while n < 0
```

```
        st += -4*((pi*j*n)+1))*(power(ex,-1*pi*j*n)+power(ex,pi*j*n))/
(power(pi*j*n,2))*(power(ex,2*pi*n*(1/5)*t));
        n = n + 1;
    end
    n = n + 1;
    while n < x
        st = st + (-4*((pi*j*n)+1))*(power(ex,-1*pi*j*n)+power(ex,pi*j*n))/
(power(pi*j*n,2))*(power(ex,2*pi*n*(1/5)*t));
        n = n + 1;
    end
end
```

iii) Sawtooth Wave:

```
function [ sw ] = sSawtooth( t,x )

    n = -x;
    sw = 0;
    j = sqrt(-1);
    ex = exp(1);
    while n <= 0
        sw = sw + 25*((-2*pi*j*t -1))/
(power(2*pi*j*t,2))*(power(ex,2*pi*n*(1/5)*t));
        n = n + 1;
    end
    while n < x
        sw = sw + 25*((-2*pi*j*t -1))/
(power(2*pi*j*t,2))*power(ex,2*pi*n*(1/5)*t);
        n = n + 1;
    end
end
```

iv) Half-Rectified Sine Wave:

```
function [ sh ] = sHalfRectifiedSinus( t,x )
    a0 = 2.5;
    n = -x;
    sh = 0;
    j = sqrt(-1);
    ex = exp(1);
    while n < 0
        sh += ((5*power(ex,-2*pi*j*t*n))/(-2*pi*j*n)*(sint-cost))/2
*(power(ex,2*pi*n*(1/5)*t));
        n = n + 1;
    end
    sh += a0*(power(ex,2*pi*n*(1/5)*t));
    n = n + 1;
    while n < x
        sh += ((5*power(ex,-2*pi*j*t*n))/(-2*pi*j*n)*(sint-cost))/2
*(power(ex,2*pi*n*(1/5)*t))
        n = n + 1;
    end
end
```