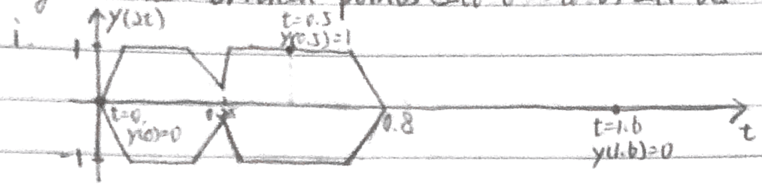
Pre-lab 2:

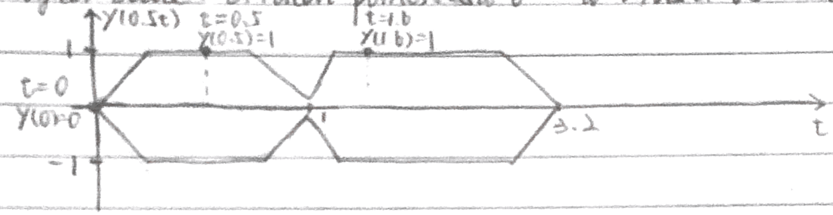
1. a: after scale: critical points: $2t_0=0 \to t_0=0$, $2t_1=0.5 \to t_1=0.25$, $2t_2=1.6 \to$

i.



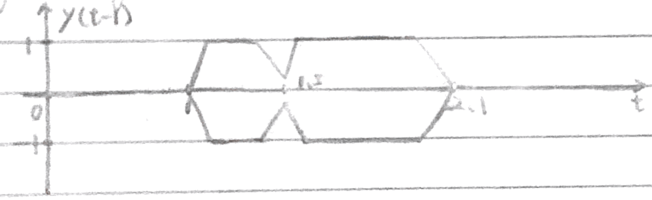
ii. y(2t) would sounds like y(t) with higher frequency.

b. after scale: critical points: $0.5t_0=0 \to t_0=0$, $0.5t_1=0.5 \to t_1=1$, $0.5t_2=1.6 \to t_2=3.2$

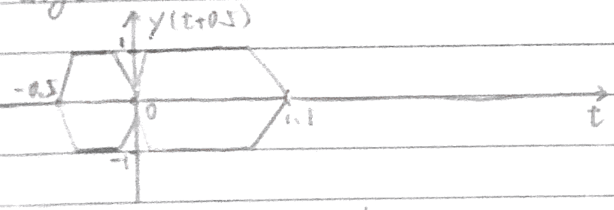


playing y(0.5t) would have sound that sounds like y(t) with lower frequency.

c. after shift 1: $t_0-1=0 \to t_0=1$, $t_1-1=0.5 \to t_1=1.5$, $t_2-1=1.6 \to t_2=2.1$



after shift 2: $t_0+0.5=0 \to t_0=-0.5$, $t_1+0.5=0.5 \to t_1=0$, $t_2+0.5=1.6 \to t_2=1.1$



2. Since we are using [0, 3] window, from graph in 1, we can observe that we would lose info of signal y(0.5t) from t=3 to t=3.2, and lose info of signal y(t+0.5) from t=-0.5 to t=0.

3. a. The parameters are x, fs, and a.

To return them simultaneously we can simply write:

return y, t

3.b.
```
def timescale(x, fs, 2):
    n,d = decimal.Decimal(2).as_integer_ratio()
    y= sig.resample_poly(x,d,n)
    t=np.arrange(0,len(y),1)*(1/fs)
    return y1, t_y1
```
4. $x(t) = y(\frac{1}{3}(t+1))$