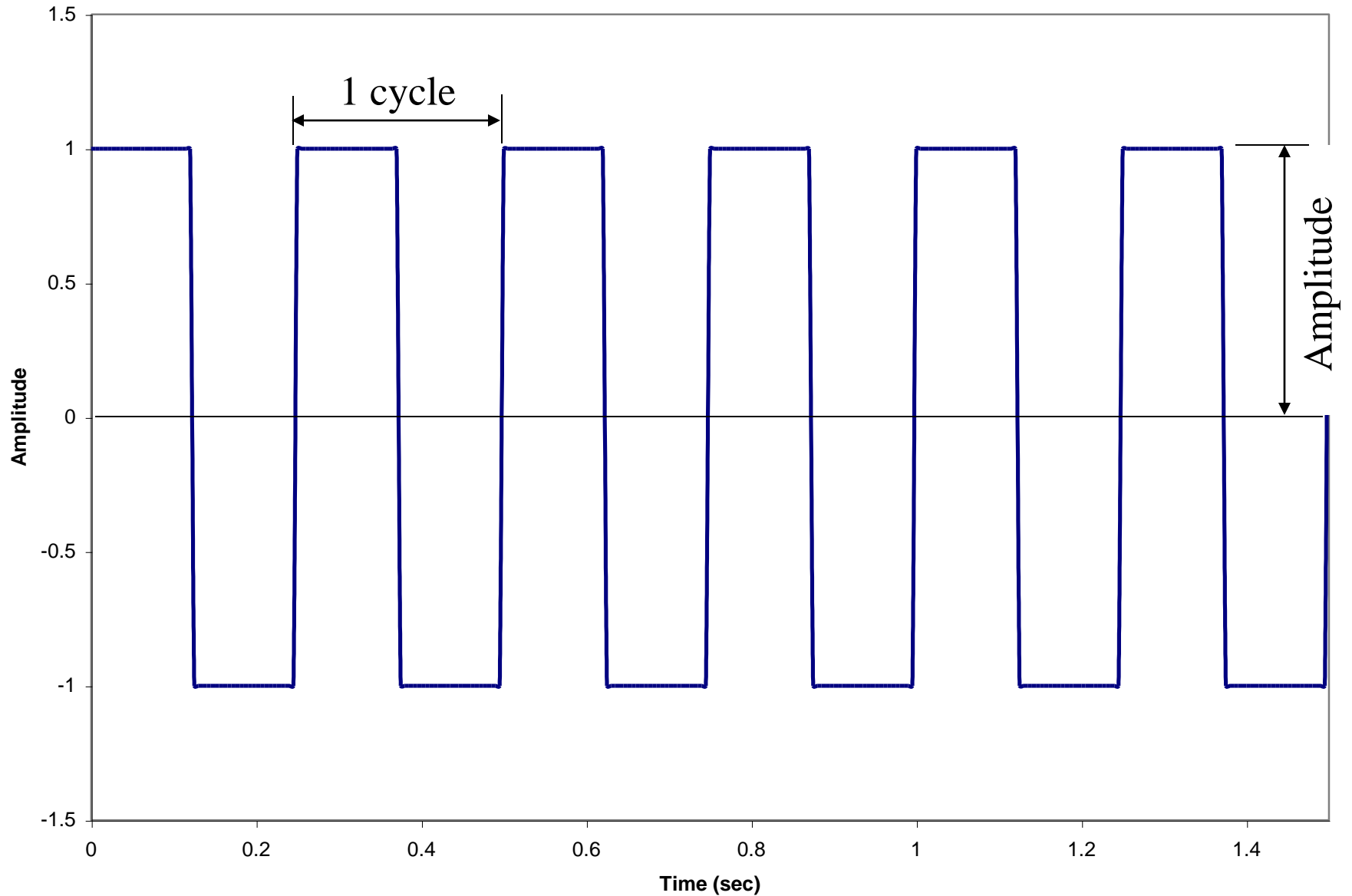
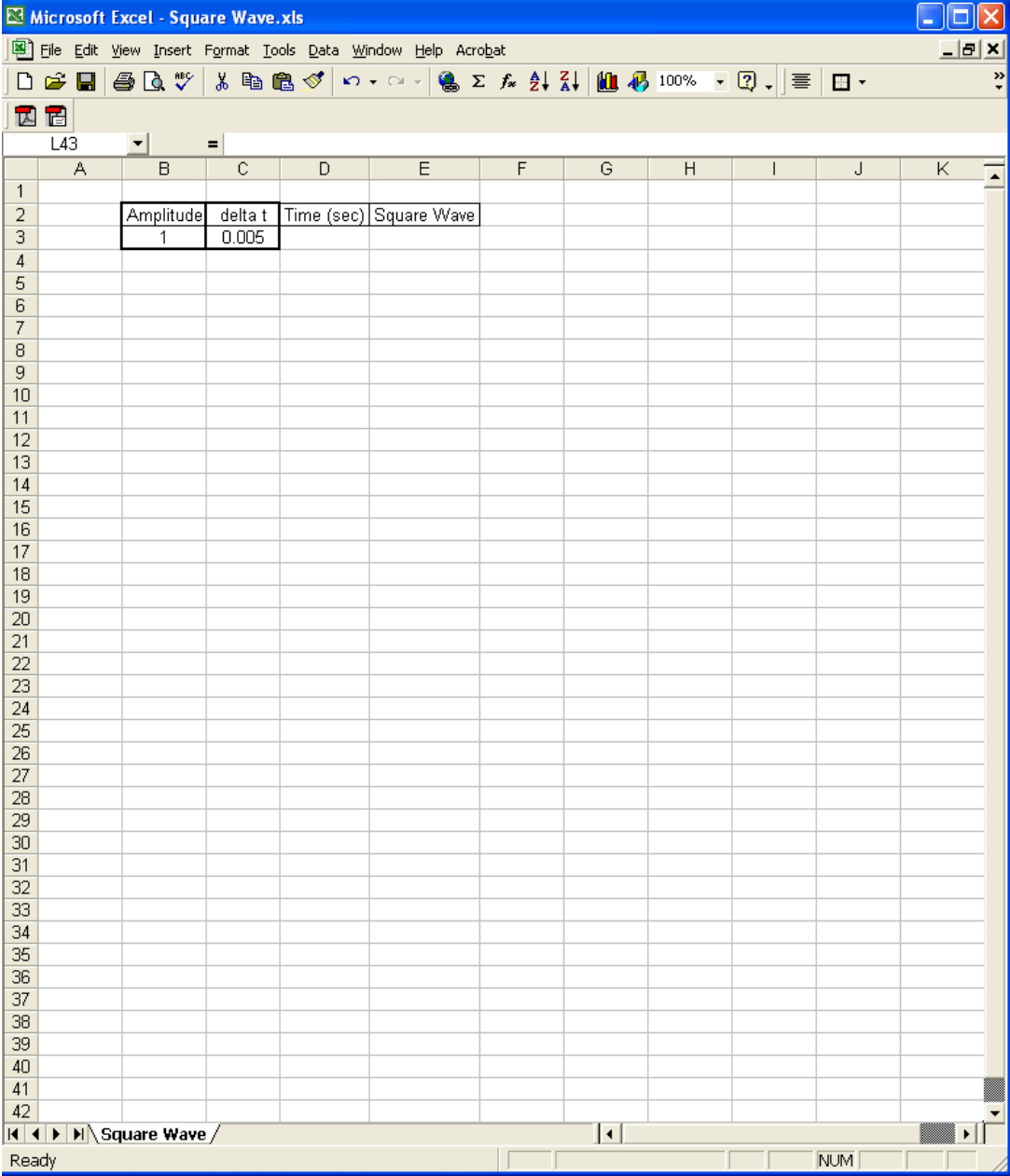


# Creating a Square Wave in Excel





# Step 2. Enter desired values for Amplitude and delta t (sec.)





### Step 3. Fill in column for Time (sec.)

Continued

- C. Highlight the desired number of rows in the time column and fill down (Ctrl +D).

The screenshot shows a Microsoft Excel window titled "Microsoft Excel - Square Wave.xls". The spreadsheet has columns A through K and rows 1 through 42. The data is as follows:

	A	B	C	D	E	F	G	H	I	J	K
1											
2		Amplitude	delta t	Time (sec)	Square Wave						
3		1	0.005	0							
4				0.005							
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
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31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
41											
42											

The Time (sec) column (D) is highlighted in blue, indicating it is selected for a fill-down operation. The status bar at the bottom shows "Ready" and "NUM".

### Step 3. Fill in column for Time (sec.)

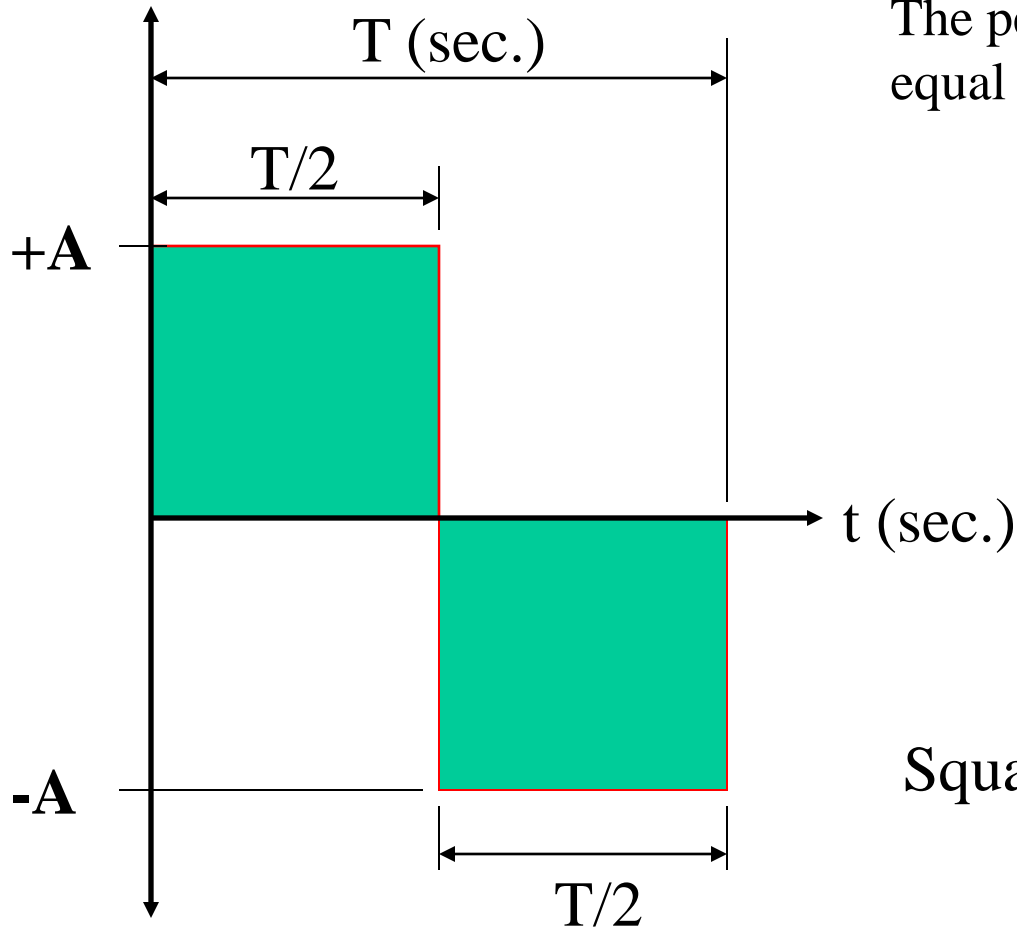
Continued

Time column after “Filling Down”

The screenshot shows a Microsoft Excel spreadsheet titled "Square Wave.xls". The spreadsheet has columns labeled A through K. Column B is labeled "Amplitude" with a value of 1. Column C is labeled "delta t" with a value of 0.005. Column D is labeled "Time (sec)" and contains a list of values from 0 to 0.195 in increments of 0.005. Column E is labeled "Square Wave". The formula bar shows the formula for cell D503:  $=D502+\$C\$3$ . The status bar at the bottom shows "Sum=626.25" and "NUM".

	A	B	C	D	E	F	G	H	I	J	K
1											
2		Amplitude	delta t	Time (sec)	Square Wave						
3		1	0.005	0							
4				0.005							
5				0.01							
6				0.015							
7				0.02							
8				0.025							
9				0.03							
10				0.035							
11				0.04							
12				0.045							
13				0.05							
14				0.055							
15				0.06							
16				0.065							
17				0.07							
18				0.075							
19				0.08							
20				0.085							
21				0.09							
22				0.095							
23				0.1							
24				0.105							
25				0.11							
26				0.115							
27				0.12							
28				0.125							
29				0.13							
30				0.135							
31				0.14							
32				0.145							
33				0.15							
34				0.155							
35				0.16							
36				0.165							
37				0.17							
38				0.175							
39				0.18							
40				0.185							
41				0.19							
42				0.195							

## Step 4. Generate Square Wave



The period ( $T$ ) of the Square Wave is equal to the inverse of the frequency ( $f$ )

$$T = 1 / f \quad (\text{Equation 2})$$

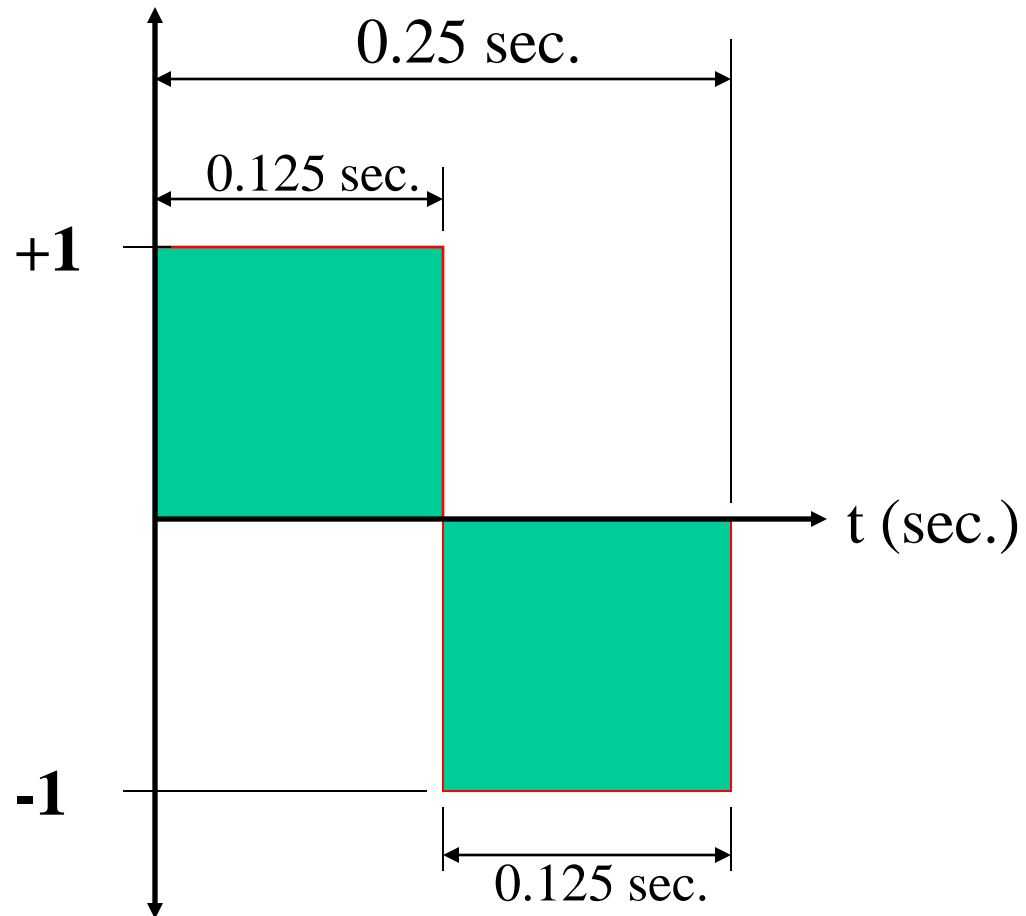
$$\text{Square Wave} = \begin{cases} +A, & 0 < t < T/2 \\ -A, & T/2 < t < T \end{cases}$$

## Step 4. Generate Square Wave

Continued

For this example: Generate a 4 Hz Square Wave with an Amplitude of 1.0

$f = 4 \text{ Hz}$ ; therefore,  $T = 0.25 \text{ sec.}$

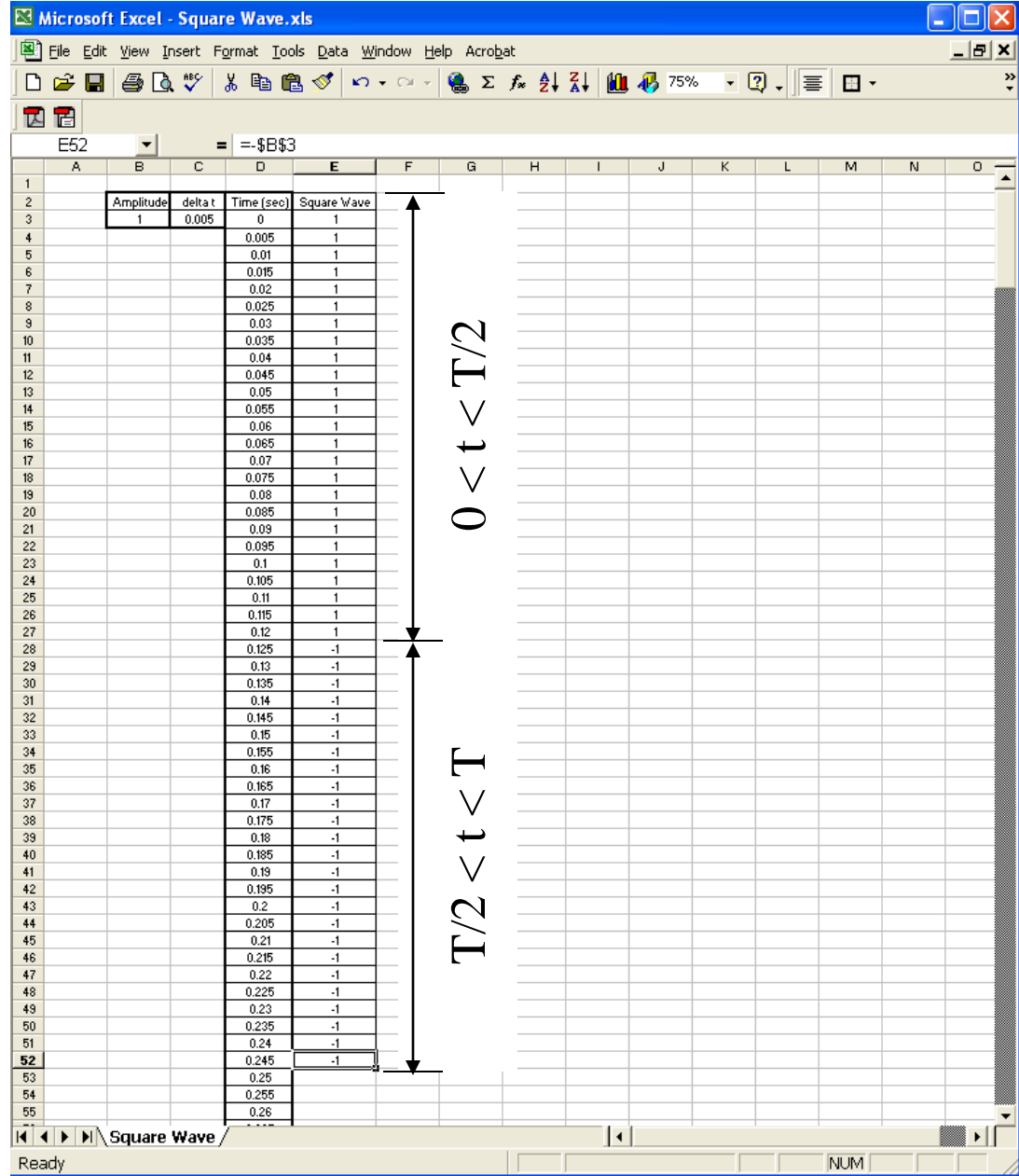
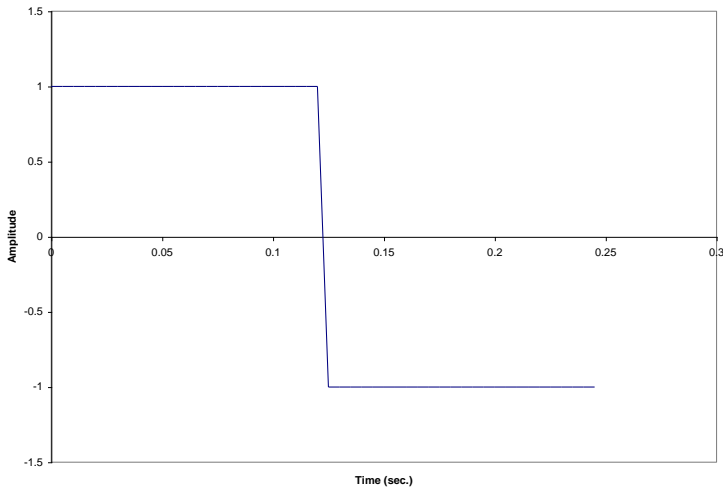




# Step 4. Generate Square Wave

Continued

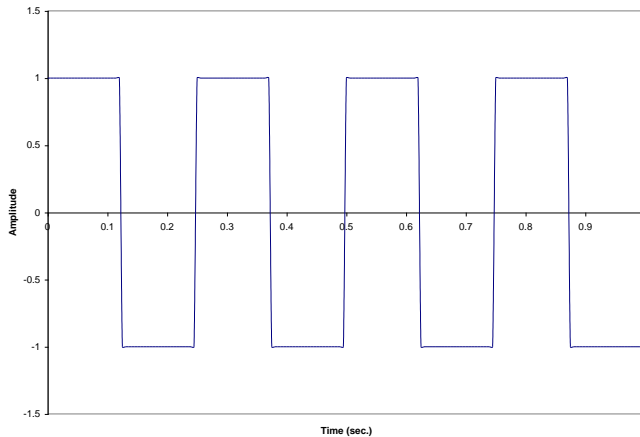
$$\text{Amplitude} = \begin{cases} +A, & 0 < t < T/2 \\ -A, & T/2 < t < T \end{cases}$$



# Step 4. Generate Square Wave

Continued

Copy cells E3 through E52 for additional Square Wave cycles.



Microsoft Excel - Square Wave.xls

File Edit View Insert Format Tools Data Window Help Acrobat

100%

E3 = =\$B\$3

	A	B	C	D	E	F	G	H	I	J	K
1											
2		Amplitude	delta t	Time (sec)	Square Wave						
3		1	0.005	0	1						
4				0.005	1						
5				0.01	1						
6				0.015	1						
7				0.02	1						
8				0.025	1						
9				0.03	1						
10				0.035	1						
11				0.04	1						
12				0.045	1						
13				0.05	1						
14				0.055	1						
15				0.06	1						
16				0.065	1						
17				0.07	1						
18				0.075	1						
19				0.08	1						
20				0.085	1						
21				0.09	1						
22				0.095	1						
184				0.905	-1						
185				0.91	-1						
186				0.915	-1						
187				0.92	-1						
188				0.925	-1						
189				0.93	-1						
190				0.935	-1						
191				0.94	-1						
192				0.945	-1						
193				0.95	-1						
194				0.955	-1						
195				0.96	-1						
196				0.965	-1						
197				0.97	-1						
198				0.975	-1						
199				0.98	-1						
200				0.985	-1						
201				0.99	-1						
202				0.995	-1						
203				1							

Chart1 / Chart2 / Square Wave

Ready Sum=0 NUM