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2. Plotting with MATLAB

An introduction to plotting in MATLAB

Introduction to Plotting MIT Differential Equations



(Caption will be displayed when you start playing the video.)

▶ 0:00 / 3:46

▶ 2.0x



Plot the Square Wave (External resource) (1.0 points possible)



Plot the (2 pi periodic) Square Wave

The 2π periodic function

$$\text{Sq}(t) = \begin{cases} 1 & 0 < t < \pi \\ -1 & -\pi < t < 0 \end{cases}$$

is built into MATLAB via the command

```
square(t)
```

The key here is that for this function to make sense, it should be acting on a vector of numerical values t .

1. Create a vector t of 1000 evenly spaced values between -2π and 2π .
2. Create a vector $\text{Sq}(t)$ equal to the square wave on the values of vector t .
3. Plot the Square wave on the interval $-2\pi < t < 2\pi$.

Script ?

 Save  Reset  MATLAB Documentation (<https://www.mathworks.com/help/>)

```
1 %Create a vector t of 1000 evenly spaced values between -2*pi and 2*pi.
2 t = linspace(-2*pi,2*pi,1000);
3 % Create a vector Sq that is equal to the square wave on inputs given by the vector t.
4 Sq = square(t); %(t<0)*(-1) + (t>=0)*1;
5
6 %Plot the square wave with t on the horizontal axis.
7 plot(t,Sq,'blue')
8
9 %The following set the spacing of ticks and labels on the x and y axes
10 %It sets the labels and increases the fontsize for readability
11 xticks([-2*pi -pi 0 pi 2*pi])
12 xticklabels({'-2\pi', '-\pi', '0', '\pi', '2\pi'})
13 yticks([-2 -1 0 1 2])
14 ylim([-2 2])
15 xlabel('t'); ylabel('Sq(t)')
16 set(gca,'fontsize',18)
```

 Run Script



Previous Assessment: All Tests Passed

Submit ?

- ✔ Check vector t
- ✔ Sq

Output

2. Plotting with MATLAB

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|---|----------------------|
| ✔ Why is my function wrong Hello, My function Sq is marked wrong while my graph looks correct. This is how I wrote my function: $Sq = (1.*(t > -2*pi)).*(t < -pi) + (-1.*(t > -pi)).*(t < 0) + (1.*(0 < t)).*(t < pi) - (1.*(pi < t)).*(...$ | 2 ▼ |
| ✔ Plot Sq(t) (for staff) I don't understand why my answer is graded "wrong" because the plot seems right. | 6 ▼ |
| ✔ [STAFF] Matlab page rendering. Staff: For some reason these Matlab exercises do not render at all in my browser. Chrome or Firefox. Are those auditing the course prevented from doing these lab exercises?... | 7 ▼ |
| ? [Staff] Script line 11 Why is there a 3*pi in this list. | 3 ▼ |

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