

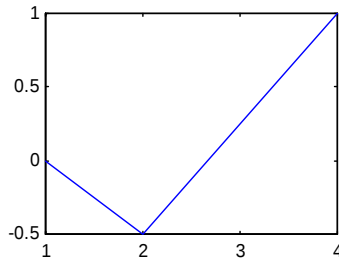
Introduction to the Matlab language: examples and exercises

A. Fill in the empty result fields.

	Matlab command:	Result:
1.	<code>a = [1;2]</code> % A column vector	<code>a =</code> 1 2
2.	<code>b = [3 4]</code> % A row vector	<code>b =</code> 3 4
3.	<code>A = [10 20 30; 40 50 60]</code> % A matrix	
4.	<code>size(A)</code>	<code>ans =</code> 2 3
5.	<code>size(a)</code>	
6.	<code>size(b)</code>	
7.	<code>c=a'</code> % Transpose	<code>c =</code> 1 2
8.	<code>b+c</code>	<code>ans =</code> 4 6
9.	<code>a+b</code>	??? Error using ==> + Matrix dimensions must agree.
10.	<code>b*a</code> % Inner (vector) product	<code>ans =</code> 11

11.	B=a*b % Outer matrix product. (Procent precedes a comment.)	B = 3 4 6 8
12.	a.*a % Element-by-element multiplication	
13.	a*a	??? Error using ==> * Inner matrix dimensions must agree.
14.	B^2 % Equal to B*B	ans = 33 44 66 88
15.	B.^2 % Equal to B.*B	ans = 9 16 36 64
16.	a*a'	ans = 1 2 2 4
17.	a'*a	ans = 5
18.	c.^b	ans = 1 16
19.	[B;B]	ans = 3 4 6 8 3 4 6 8
20.	[B B]	ans = 3 4 3 4 6 8 6 8
21.	[a' a']	
22.	d=[b b 0]	d = 3 4 3 4 0

23.	zeros(2,3)	ans = 0 0 0 0 0 0
24.	zeros(size(b))	ans = 0 0
25.	[A ones(2,1); zeros(1,4)]	ans = 10 20 30 1 40 50 60 1 0 0 0 0
26.	sum(A) % Column sum	ans = 50 70 90
27.	sum(A')	ans = 60 150
28.	prod(A) % Column product	ans = 400 1000 1800
29.	mean(A) % Column average	
30.	max(A) % Column maximum	
31.	max(a) % Vector maximum	ans = 2
32.	mean(b) % Vector average	ans = 3.5
33.	sort([5 2 3])	ans = 2 3 5
34.	rand(2,4)	ans = (For example) 0.9501 0.6068 0.8913 0.4565 0.2311 0.4860 0.7621 0.0185
35.	mean(rand(1,1000))	ans = 0.5018 (For example)

36.	Help length	LENGTH Length of vector. LENGTH(X) returns the length of vector X. It is equivalent to MAX(SIZE(X)) for non-empty arrays and 0 for empty ones.
37.	length(a)	ans = 2
38.	length(A)	ans = 3
39.	b+i*c % Vector of complex numbers	ans = 3.0000 + 1.0000i 4.0000 + 2.0000i
40.	b+j*c % The same	ans = 3.0000 + 1.0000i 4.0000 + 2.0000i
41.	z=a.*exp(j*c*pi/2) % Not in the ingvet course	z = 0.0000 + 1.0000i -1.0000 + 0.0000i 0.0000 + 2.0000i -2.0000 + 0.0000i
42.	abs(z) % Not in the ingvet course	ans = 1 1 2 2
43.	angle(z) % Not in the ingvet course	ans = 1.5708 3.1416 1.5708 3.1416
44.	plot([1 2 4],[0 -0.5 1])	
45.	4:9	ans = 4 5 6 7 8 9
46.	4:2:9	ans = 4 6 8
47.	t=(-1:0.1:1)	

48.	<code>v=sin(2*pi*2*t); % Semicolon gives suppressed display</code>	(No printout. v is a vector consisting of 21 values.)
49.	<code>plot(t,v) title('Sine wave') xaxis('t [seconds]') yaxis('v(t) (Volts)')</code>	
50.	<code>plot(v)</code>	(The same figure, but the x-axis is scaled from 1 to 21.)
51.	<code>plot(t,abs(v))</code>	
52.	<code>A(2,2)</code>	50
53.	<code>d(4)</code>	
54.	<code>d([3 4 2])</code>	ans = 3 4 4
55.	<code>d(4:5)</code>	
56.	<code>d(1:2:5) % Every second element in d</code>	
57.	<code>d(1:end-1) % Equal to d(1:length(d)-1)</code>	

58.	d*1+1 % Multiplication and addition of vector scalar.	ans = 4 5 4 5 0
59.	A(2,:) % Row number 2, all columns	ans = 40 50 60
60.	A(:) % Convert to a column vector	ans = 10 40 20 50 30 60
61.	A>20	ans = 0 0 1 1 1 1
62.	A>=20	
63.	A==20	
64.	find(A>20)	ans = 2 4 5 6
65.	A(find(A>20))	
66.	[e index]=sort(d)	e = 0 3 3 4 4 index = 5 1 3 2 4
67.	d(index)	
68.	e(2)=[] % Remove element number 2	
69.	e(8) = 1 % Extend e to 8 elements. % Put zeros in unknown positions.	e = 0 3 4 4 0 0 0 1

70.	<pre>for(k=3:0.5:4) k end</pre>	<pre>k = 3 k = 3.5000 k = 4</pre>
71.	Give an example of a "while" loop	
72.	Give an example of an "if" statement	
73.	Give an example of a Matlab script and how to call it	
74.	Give an example of a Matlab function and how to call it	