

Key to MATLAB Exersise 1 - Matrices & Arrays

1. `>> x0=10; v0=15; t=5; a=-9.81; x=x0+v0*t+1/2*a*t^2`
2. `>> x=3,v=4;`
 1) `>> log(x^2+v^2)`
 2) `>> (x-3)^(1/2)/(x-2*v)^2`
 3) `>> 4/3*pi*v^2`
 4) `>> abs(sin(2*x))*exp(v)`
 5) `>> sqrt(x-5)`
 or
`>> (x-5)^(1/2)`
 6) `>> x/(v-4)` Warning: Divide by zero. `ans =Inf`
 7) `>> -x/(v-4)` Warning: Divide by zero. `ans =-Inf`
 8) `>> eps`
 9) `>> (x-3)/(v-4)` Warning: Divide by zero. `ans = NaN`
3. `ans = 2`
`ans = 0.5000`
4. 1) `>> d=[23:-3:2]`
`>> numel(d)`
 or
`>> d=[23,20,17,14,11,8,5,2]`
`>> numel(d)`
 - 2) `>> a=[1 2 3 4
2 4 6 8
3 6 9 12];`
 or
`>> a = [1:4; 2:2:8; 3:3:12];`
 or
`>> a1 =[1:4]; a = [a1; 2*a1; 3*a1];`
5. 1) `>> size(a)`
 2) `>> a(2,3)`
`>> b=a(:,[1,3])`
 3) `>> c=a([1,3,2],:)`
 4) `>> x=a(:,end)`
 5) `>> a(1,1)=0`
 6) omitted
 7) omitted
 8) `>> a35=a; a35(:,5)=[1;1;1]`
 or
`>> aa35=[a, [10; 20; 30]]`
`>> a44=a; a44(4,:)=[1 1 1 1]`
 or
`>> a44=(a; 1 1 1 1)`

- 9)-14) omitted
6. `>> x=A\B`
`ans x=`
`-0.5000`
`1.0000`
`-0.5000`
7. `>> A/B`
`??? Error using ==> mrdivide`
`matrix dimensions must agree.`
`A/B is equivalent to the expression AB^{-1} , but here B is a vector, there is no invert of B.`
8. 1) `>> x=ones(6,1); A*x`
`ans = 0`
`0`
`0`
`0`
`0`
`0`

From A^*x , we get the sum of every row of A, so we know that the determinant of A equal to 0, that is A must be singular.

- 2) omitted
9. `>> A = magic (8); sum(A(:,1:7))`
`ans = 260 260 260 260 260 260 260`
10. `>> a=[1 2 1]; A=[a;a*2;a*3]; C=[-1 -1 -1]'; D=[-2 -2 4]';`
1) `>> A*C`
`>> A*D`

The results show that though $A \neq 0$, $AC=AD$, but C is not equal to D. Therefore the proposition is not true.

- 2) `>> A=round(10*rand(3)); B=round(10*rand(3));`
`>> inv(A+B)`
`>> inv(A)+inv(B)`

The proposition is not true.

- 3) `>> (A+B)^2`
`>> A^2+2*A*B+B^2`

The proposition is not true.

- 4) `>> A=round(10*rand(3)); B=A+A';`
`>> B == B'`

```
ans =
1     1     1
1     1     1
1     1     1
```

We may try it more times. All results show the proposition is true.

11. omitted