**SOLUCIONÁRIO DOS EXERCÍCIOS DO MINICURSO DO MATLAB**

**1. Formatos Numéricos**

Exercício 1

|  |
| --- |
| a) >> (5+8\*3-2)/(4^3\*3)b) >> sqrt(10-2\*32/13)-1/4\*10c) >> 2^2+sqrt(5-4\*1) |

Exercício 2

|  |
| --- |
| >> x1 = -20 - sqrt(20^2-4\*5\*10)>> x2 = -20 + sqrt(20^2-4\*5\*10) |

Exercício 3

|  |
| --- |
| >> format long>> 1 + 11,5\*1/17>> format short >> ans>> format hex>> ans>> format rat>> ans |

Exercício 4

|  |
| --- |
| >> e = 2.718>> t = 2018>> (157273000)/(1+e^(-0.0313\*(t-1913.25))) |

**2. Comandos básicos**

Exercício 1

|  |
| --- |
| >> h = 15;>> alfa = 30;>> A = ((h\*sin(degtorad(alfa)))\*(h\*cos(degtorad(alfa))))/2; |

Exercício 2

|  |
| --- |
| >> a = round(11.3);>> b = round(35/3);>> c = round(-12.5);>> d = round(52/3);>> e = round(-16.2);>> T = a+b+c+d+e+17; |

Exercício 3

|  |
| --- |
| >> x = degtorad(45);>> a = x/factorial(1);>> b = (-1)\*(x^3)/factorial(3);>> c = (x^5)/factorial(5);>> d = (-1)\*(x^7)/factorial(7);>> s = a+b+c+d; |

Exercício 4

|  |
| --- |
| >> t = 5;>> a = log((t^2)+t+2);>> b = exp(t\*(1+cos(3\*t)));>> c = (sec(t))^2+cot(t)-1;>> t = 10;>> a2 = log((t^2)+t+2);>> b2 = exp(t\*(1+cos(3\*t)));>> c2 = (sec(t))^2+cot(t)-1; |

**3. Números Complexos**

Exercício 1

|  |
| --- |
| >> x = sqrt(3) + i;>> m = abs(x);>> ang = radtodeg(angle(x));>> y = 4 - 3\*i;>> m = abs(y);>> ang = radtodeg(angle(y));>> z = 5\*i;>> m = abs(z);>> ang = radtodeg(angle(z)); |

Exercício 2

|  |
| --- |
| >> r = [10 5 1];>> tetha = [135 240 200];>> x = r.\*cos(degtorad(tetha));>> y = r.\*sin(degtorad(tetha)); |

Exercício 3

|  |
| --- |
| >> a = 1;>> b = 10;>> c = 20;>> x1 = (-b+(sqrt(b^2-4\*a\*c)))/(2\*a);>> x2 = (-b-(sqrt(b^2-4\*a\*c)))/(2\*a);>> y1 = sqrt(x1);>> y2 = -sqrt(x1);>> y3 = sqrt(x2);>> y4 = -sqrt(x2);>> r1 = abs(y1);>> ang1 = angle(y1);>> r2 = abs(y2);>> ang2 = angle(y2);>> r3 = abs(y3);>> ang3 = angle(y3);>> r4 = abs(y4);>> ang4 = angle(y4); |

**4. Matrizes e Vetores**

Exercício 1

|  |
| --- |
| >> v = 15:-5:-25>> v' |

Exercício 2

|  |
| --- |
| >> v = linspace(-1,-15,12)>> v' |

Exercício 3

|  |
| --- |
| >> M = [1:3:25; 72:-6:24; 0:0.125:1] |

Exercício 4

letra (a)

|  |
| --- |
| >> A = [1:1:7; 2:2:14; 21:-3:3; 5:5:35];>> aux = [A(1,:); A(3,:); A(4,:)];>> B = [aux(:,1) aux(:,3) aux(:,5) aux(:,7)]; |

letra (b)

|  |
| --- |
| >> A = [1:1:7; 2:2:14; 21:-3:3; 5:5:35];>> u =[A(3,:) (A(:,5))' (A(:,7))']; |

Exercício 5

|  |
| --- |
| >> A = eye(7);>> A(1:2,1:3)=2;>> A(1:3,5:7)=5;>> A(3,1:3)=3;>> A(5:7,1:2)=4;>> A(5:7,3)=7;>> A(5:7,5:7)=9; |

Exercício 6

|  |
| --- |
| >> M=ones(3);>> B(1:2,1:2)=5;>> A(1:3,1:3)=M;>> A(4:5,4:5)=B; |

Exercício 7

|  |
| --- |
| >> g = 9.81;>> m = [2, 4, 5, 10, 20, 50];>> F = [12.5, 23.5, 30, 61, 117, 294];>> mi = F./(m\*g); |

**5. Scripts**

Exercício 1

|  |
| --- |
| >> V = 250;>> h = [5 6 7 8 9];>> r = sqrt((3\*V)./(pi\*h));>> S = pi\*r.\*sqrt((r.^2)+(h.^2)); |

Exercício 2

|  |
| --- |
| >> Po = 50000000;>> d = 20;>> t = [5 10 15];>> P = Po\*2.^(t/d); |

Exercício 3

|  |
| --- |
| >> w =4.5;>> u = 14;>> tetha = [0 10 20 30 40 50 60];>> h = w./cos(degtorad(tetha));>> caminho1=(50000\*w)+(35000\*u);>> l = sqrt((h.^2)-(w.^2));>> caminho2=(50000\*h)+(35000\*(u-l)); |

Exercício 4

|  |
| --- |
| >> t = 10;>> a = 1.75;>> v = a\*t;>> d = 1/2\*a\*t^2; |

**6. Polinômios**

Exercício 1

|  |
| --- |
| >> x=-2:.1:2;>> y=1.5\*x.^3-6\*x.^2+x+2; |

Exercício 2

|  |
| --- |
| >> p=[4 6 -2 -5 3];>> q=[1 4 2];>> [t,r]=deconv(p,q) |

Exercício 3

|  |
| --- |
| >> p=[(4/3\*pi+4\*pi) 0 0 -.85]>> roots(p) |

**7. Gráficos**

Exercício 1

|  |
| --- |
| >> x = -50:0.1:50;>> y = 3\*x.^3-26\*x+10;>> plot(x,y); |

Exercício 2

|  |
| --- |
| >> p=[4 6 -2 -5 3];>> q=[1 4 2];>> [t,r]=deconv(p,q) |

Exercício 3

|  |
| --- |
| >> t=1900:1:2100;>> P=157273000./(1+exp(-0.0313.\*(t-1913.25)));>> plot(t,P) |

Exercício 4

|  |
| --- |
| >> t=0:0.01:6\*pi;>> z=t;>> x=sin(t);>> y=cos(t);>> plot3(x,y,z) |

**8. Interpolação e Ajuste de curvas**

Exercício 1

letra (a)

|  |
| --- |
| T=[27.0228 25.4152 23.7288 22.3201 21.4839 21.3796]P=0:.5:2.5p=1.75t=interp1(P,T,p) |

letra (b)

|  |
| --- |
| PolIn=polyfit(P,T,5)t2=polyval(PolIn,p) |

letra (c)

|  |
| --- |
| t2-t |

letra (d)

|  |
| --- |
| tprox=polyval(Polin,3.0) |

Exercício 2

|  |
| --- |
| n=5 %grau do polinômio de ajusteP=polyfit(x,y,n) %polinômio de ajuste |

**9. Comandos de fluxo**

Exercício 1

|  |
| --- |
| >> A=zeros(6,7)>> for i = 1:6>> for j = 1:7>> if (i>=j)>> A(i,j)=2\*i-3\*j;>> else>> A(i,j)=sqrt(7\*i^2+5\*j^2);>> end>> end>> end>> A |

Exercício 2

|  |
| --- |
| >> N=[10 7 9 8 7.5 1 1];>> MEDIA=mean(N);>> aulas=20;>> faltas=7;>> FREQUENCIA=100\*(aulas-faltas)/aulas;>> if (MEDIA>=6&FREQUENCIA>=70)>> fprintf(“Aprovado\n”)>> else>> fprintf(“Reprovado\n”)>> if MEDIA<6&FREQUENCIA>=70>> fprintf(“Causa: Nota insuficiente\n”)>> elseif MEDIA<6&amp;FREQUENCIA<70>> fprintf(“Causa: Nota e frequência insuficientes\n”)>> else>> fprintf(“Causa: Frequência insuficiente\n”)>> end>> end |

Exercício 3

|  |
| --- |
| >> V=[9;6;2;3;8;6;4;45;26;9;8;22;6;589;21;7;9];>> tamanho\_de\_V=length(V);>> contador=0;>> for i=1:tamanho\_de\_V>> if rem(V(i,1),2)==0>> contador=contador+1;>> end>> end>> contador |

Exercício 4

|  |
| --- |
| >> A=[7;2;1];>> B=3\*A;>> produto\_interno=dot(A,B);>> a=A/norm(A);>> b=B/norm(A);>> if produto\_interno==0>> fprintf(“Os vetores são ortogonais entre si”);>> end>> if b==a>> fprintf(“Os vetores são paralelos entre si”);>> else>> C=cross(A,B);>> c=C/norm(C);>> end |

**10. Derivação e Integração**

Exercício 1

|  |
| --- |
| >> syms x>> z = 1/(0.8\*x^2+0.5\*x+2)>> diff(z,x)>> int(z,x,0,5) |

Exercício 2

|  |
| --- |
| a)>> syms x>> S=x^3+9\*(x^2)+27\*x-27;>> S1=(x+3)^3-x^2-5\*x-12;>> S\*S1;>> subs(ans,x,10)b)>> syms x>> S=x^3+9\*(x^2)+27\*x-27;>> S1=(x+3)^3-x^2-5\*x-12;>> S/S1;>> subs(ans,x,10)c)>> syms x>> S=x^3+9\*(x^2)+27\*x-27;>> S1=(x+3)^3-x^2-5\*x-12;>> S+S1;>> subs(ans,x,10)d)>> S\*S1>> [x valor]=fminbnd('-(x^3 + 9\*x^2 + 27\*x - 27)\*(5\*x - (x + 3)^3 + x^2 + 12)',0,10)>> [x valor]=fminbnd('-(-(x^3 + 9\*x^2 + 27\*x - 27)\*(5\*x - (x + 3)^3 + x^2 + 12))',0,10)>> S/S1>> [x valor]=fminbnd('-(x^3 + 9\*x^2 + 27\*x - 27)/(5\*x - (x + 3)^3 + x^2 + 12)',0,10)>> [x valor]=fminbnd('-(-(x^3 + 9\*x^2 + 27\*x - 27)/(5\*x - (x + 3)^3 + x^2 + 12))',0,10)>> S+S1>> [x valor]=fminbnd('22\*x + (x + 3)^3 + 8\*x^2 + x^3 - 39',0,10)>> [x valor]=fminbnd('-(22\*x + (x + 3)^3 + 8\*x^2 + x^3 - 39)',0,10) |

Exercício 3

|  |
| --- |
| >> syms x>> I = exp(2\*x)\*sqrt(2-exp(2\*x))>> diff(I)>> int(I) |