**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\*10  c)  >> 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:.5:2.5  p=1.75  t=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 ajuste  P=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) |