

052201150黄佳炜

5, 1

```
x=1; while (x+x>x), x=x/2; end  
%运行前是1, 运行后是0
```

```
x=1; while (x+x>x), x=2*x; end  
%运行前是1, 运行后是inf
```

5.2

```
format long  
Sum=0;  
x=31*pi/2;  
i=1;  
while abs((-1)^(i-1)*x^(2*i-1)/factorial(2*i-1))>10e-16  
    Sum=Sum+(-1)^(i-1)*x^(2*i-1)/factorial(2*i-1);  
    i=i+1;  
end  
disp('误差: ')
```

误差:

```
disp(Sum-sin(x));
```

3.420943942999069e+04

```
Sum=0;  
x=pi/2;  
i=1;  
while abs((-1)^(i-1)*x^(2*i-1)/factorial(2*i-1))>10e-16  
    Sum=Sum+(-1)^(i-1)*x^(2*i-1)/factorial(2*i-1);  
    i=i+1;  
end  
disp('误差: ')
```

误差:

```
disp(Sum-sin(x));
```

0

%出现上述原因是因为31*pi/2数很大, 收敛速度很慢

5.3

```
target = 4;
guess = 0;
while guess ~= target
    guess = input('猜一个数 (1-100): ');
    if guess < target
        disp('太低了');
    elseif guess > target
        disp('太高了');
    else
        disp('恭喜你, 猜对了! ');
    end
end
```

恭喜你, 猜对了!

5.4

```
primeNumbers = [];  
number = 2;  
while number <= 100  
    isPrime = true;  
    for i = 2:sqrt(number)  
        if mod(number, i) == 0  
            isPrime = false;  
            break;  
        end  
    end  
    if isPrime  
        primeNumbers = [primeNumbers, number];  
    end  
    number = number + 1;  
end  
disp('1到100间的所有素数为: ');
```

1到100间的所有素数为:

```
disp(primeNumbers');
```

```
2  
3  
5  
7  
11  
13  
17  
19  
23  
29  
31  
37  
41  
43  
47  
53  
59  
61  
67  
71  
73  
79
```

5.5

```
maxNumber=110;
primeNumbers = [];
number = 2;
maxPrime=0;
while number <= maxNumber
    isPrime = true;
    for i = 2:sqrt(number)
        if mod(number, i) == 0
            isPrime = false;
            break;
        end
    end
    if isPrime
        primeNumbers = [primeNumbers, number];
        if number>=maxPrime
            maxPrime=number;
        end
    end
    number = number + 1;
end
disp('最大素数为: ');
```

最大素数为:

```
disp(maxPrime);
```

109

5.6

```

score = input('请输入成绩(百分制):');

if score >= 90 && score <= 100
    grade = 'A';
elseif score >= 80 && score < 90
    grade = 'B';
elseif score >= 70 && score < 80
    grade = 'C';
elseif score >= 60 && score < 70
    grade = 'D';
elseif score >= 0 && score < 60
    grade = 'E';
else
    grade = '无效成绩';
end

fprintf('对应的等级是: %s\n', grade);

```

对应的等级是: A

```

grade = input('请输入成绩等级(A, B, C, D, E):', 's');

switch grade
    case 'A'
        scoreRange = '90--100';
    case 'B'
        scoreRange = '80--89';
    case 'C'
        scoreRange = '70--79';
    case 'D'
        scoreRange = '60--69';
    case 'E'
        scoreRange = '0--59';
    otherwise
        scoreRange = '无效等级';
end

fprintf('对应的分数区间是: %s\n', scoreRange);

```

对应的分数区间是: 90--100

6.1

```

p = [6 0 -5 1 0];
q = [0 6 0 0 -1];

% 计算 p(x) + q(x)
sumPQ = p+q;

% 计算 p(x) * q(x)
productPQ = conv(p, q);

% 计算 p(x) 的导数
dp = polyder(p);

% 计算 q(x) 的导数
dq = polyder(q);

% 显示结果
disp('p(x) + q(x) = ');

```

$p(x) + q(x) =$

```
disp(poly2sym (sumPQ));
```

$6x^4 + 6x^3 - 5x^2 + x - 1$

```
disp('p(x) * q(x) = ');
```

$p(x) * q(x) =$

```
disp(poly2sym (productPQ));
```

$36x^7 - 30x^5 + 5x^2 - x$

```
disp('p'(x) = ');
```

$p'(x) =$

```
disp(poly2sym (dp));
```

$24x^3 - 10x + 1$

```
disp('q'(x) = ');
```

$q'(x) =$

```
disp(poly2sym (dq));
```

$18x^2$

6.2

```
p = [816 -3835 6000 -3125];
```

```
% 求出 p(x) 的所有零点
```

```
rootsP = roots(p);
```

```
% 显示所有零点
```

```
disp('p(x) 的所有零点为: ');
```

p(x) 的所有零点为:

```
disp(rootsP);
```

```
1.6666666666666684
```

```
1.5624999999999985
```

```
1.470588235294116
```

```
p=@(x)816*x^3-3835*x^2+6000*x-3125
```

p = 包含以下值的 function_handle:

```
@(x)816*x^3-3835*x^2+6000*x-3125
```

```
% 用 fzero 计算 p(x) 的第二大零点
```

```
secondLargestRoot = fzero(p, [max(rootsP)/2 min(rootsP)]);
```

```
disp('p(x) 的第二大零点为: ');
```

p(x) 的第二大零点为:

```
disp(secondLargestRoot);
```

```
1.470588235294116
```

6.3

```
syms x y;
[solx,soly]=solve(x^2+y^2-4,x^2-y^2-1,x,y);
disp(solx);
```

$$\begin{pmatrix} -\frac{\sqrt{10}}{2} \\ \frac{\sqrt{10}}{2} \\ -\frac{\sqrt{10}}{2} \\ \frac{\sqrt{10}}{2} \end{pmatrix}$$

```
disp(soly);
```

$$\begin{pmatrix} -\frac{\sqrt{6}}{2} \\ -\frac{\sqrt{6}}{2} \\ \frac{\sqrt{6}}{2} \\ \frac{\sqrt{6}}{2} \end{pmatrix}$$

6.4

```
T{1}=[1];
T{2}=[1 0];
T{3}=conv(T{2}, [2,0])-[0,0,T{1}]
```

T = 1×21 cell

	1	2	3	4	5	6	7
1	1	[1,0]	[2,0,-1]	[4,0,-3,0]	[8,0,-8,0,1]	[16,0,-20,0,5,0]	[32,0,-4

```
for i=4:21
    T{i}=conv(T{i-1}, [2,0])-[0,0,T{i-2}];
end

disp(T{21})
```

524288	0	-2621440	0	5570560	0	-6553600	0
--------	---	----------	---	---------	---	----------	---

6.5


```

vectcor1=[1 2 3];
vectorSize1=size(vectcor1,2);
verctor2=[1 2 3 4 5];
vectorSize2=size(verctor2,2);
if vectorSize1>vectorSize2
    i=0;
    while i<vectorSize1-vectorSize2
        verctor2=[0 verctor2];
        i=i+1;
    end
end
if vectorSize1<vectorSize2
    i=0;
    while i<vectorSize2-vectorSize1
        vectcor1=[0 vectcor1];
        i=i+1;
    end
end
disp(vectcor1);

```

```

0      0      1      2      3

```

```

disp(verctor2);

```

```

1      2      3      4      5

```