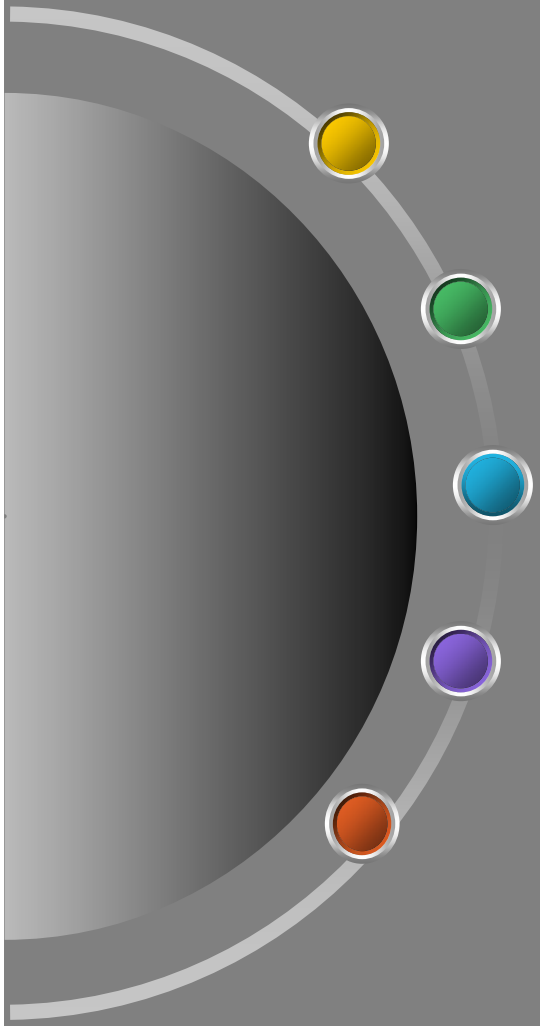
6.5 方程求根的若干Matlab函数文件



6.5.1 二分法的Matlab函数文件

6.5.2 Newton迭代法的Matlab函数文件

6.5.3 割线法的Matlab函数文件

6.5.1 二分法的*Matlab*函数文件

```
function[x, y] = bisect( fun, a, b, tol, max)
a(1) = a; b(1) = b;
ya(1) = feval( fun, a(1)); yb(1) = feval( fun, b(1));
if      ya(1) * yb(1) > 0.0
    disp('在区间端点函数同导'); break;
end
for     i = 1: max
        x(i) = (a(i) + b(i)) / 2; y(i) = feval( fun, x(i));
        if      abs(x(i) – a(i)) < tol
            disp('二分法已收敛'); break;
        end
```

```
if      y(i) = 0.0
   disp('准确解 '); break ;
elseif     y(i)*ya(i) < 0
    a(i+1) = a(i); ya(i+1) = ya(i);
    b(i+1) = x(i); yb(i+1) = y(i);

else
   a(i+1) = x(i); ya(i+1) = y(i);
   b(i+1) = b(i); yb(i+1) = yb(i);
end
       iter  = i;
  end
  if      iter >= max
```

```
    disp('没有得到满足精度要求  的根');
end
n=length(x);k=1:n;out[k'  a(1:n)'  b(1:n)'  x'  y'];
disp('step  a  b  x'  y'  ')
```

6.5.2 Newton迭代法的Matlab函数文件

```
function[x,y]=newton(fun,fun_pr,x1,tol,max)
x(1)=x1;y(1)=feval(fun,x(1));
y_pr(1)=feval(fun_pr,x(1));
for  i=2:max
    x(i)=x(i-1)-y(i-1)/y_pr(i-1);
    y(i)=feval(fun,x(i));
    if  abs(x(i)-x(i-1))<tol
        disp('Newton迭代法已收敛');break;
    end
```

```
    y_pr(i) = feval(fun_pr, x(i));
    iter = i;
end
if iter >= max
   disp('没有得到满足精度要求      的根 ');
end
n = length(x); k = 1:n; out = [k' x' y'];
disp('  step    x    y   ')
disp(out)
```

6.5.3 割线法的*Matlab*函数文件

```
function [x, y] = sec ant(fun, a, b, tol, max)
x(1) = a; x(2) = b;
y(1) = feval(fun, x(1)); y(2) = feval(fun, x(2));
for i = 2:max
```

```
x(i+1)=x(i)-y(i)*(x(i)-x(i-1))/(y(i)-y(i-1));
y(i+1)= feval(fun,x(i+1));
if (abs(x(i+1)-x(i))<tol)
    disp('割线法已收敛');break;
end
    if      y(i)=0.0
      disp('准确解');break;
     end
     iter=i;
end
if      iter >= max
  disp('没有满足精度要求的根');
end
```

$$R = length(x); k = 1:n; out = [k' \quad x' \quad y'];$$

$$disp('step \quad x \quad y \quad ')$$

$$disp(out)$$