

Appendix

3. (c)

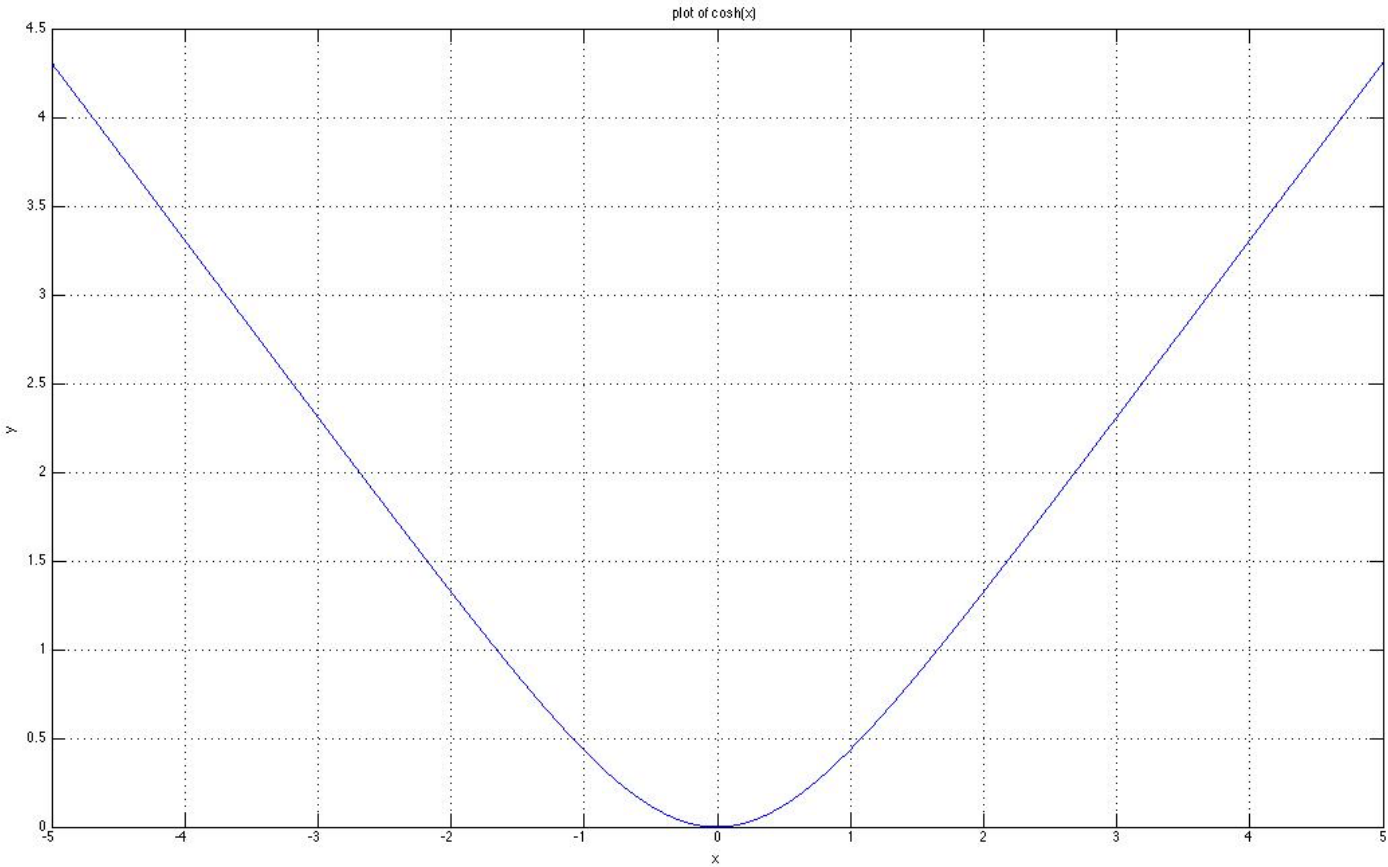


Figure 1      The plot of f(x)

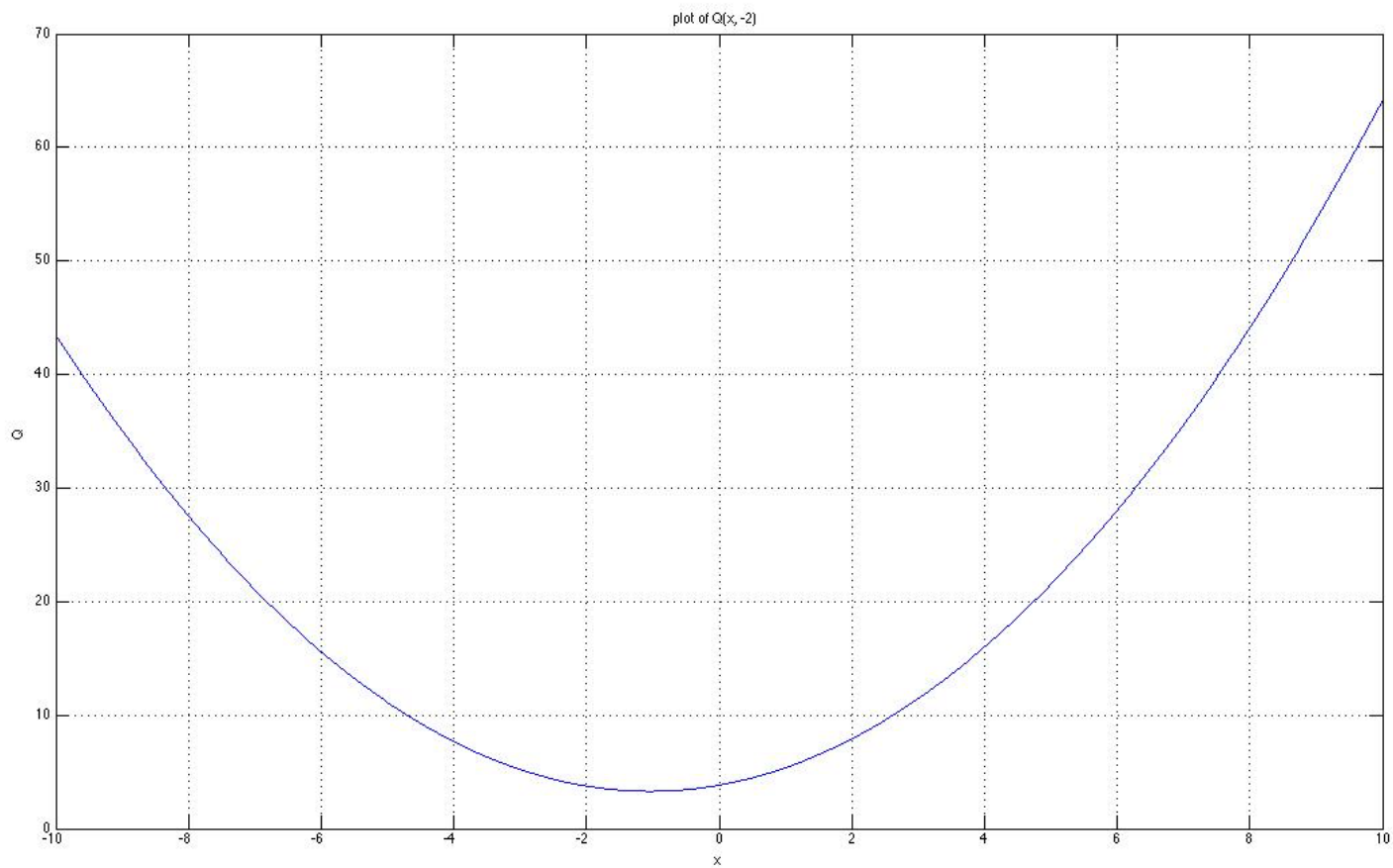


Figure 2 The plot of  $Q(x, -2)$

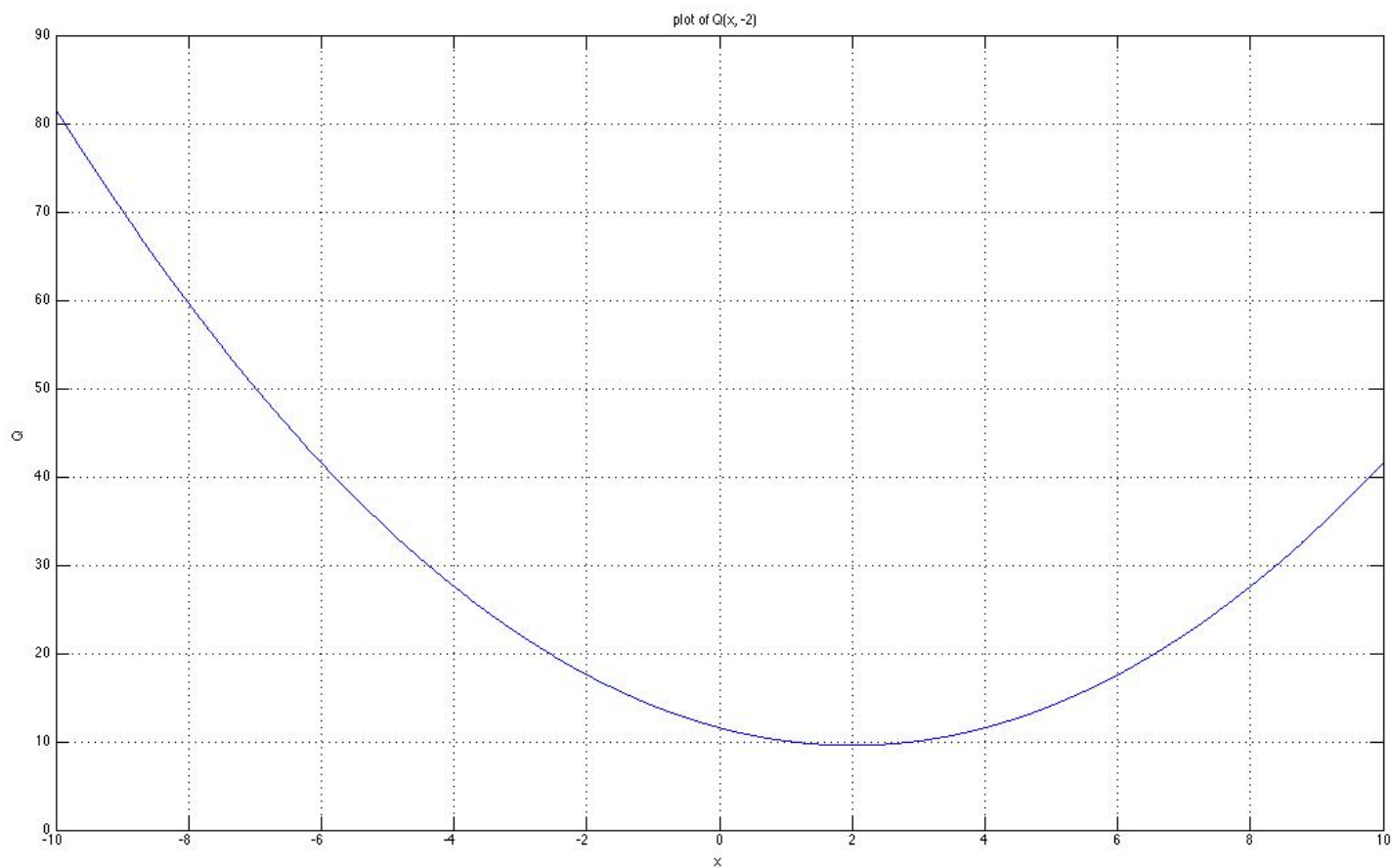


Figure 3 The plot of  $Q(x, 3)$

(g)

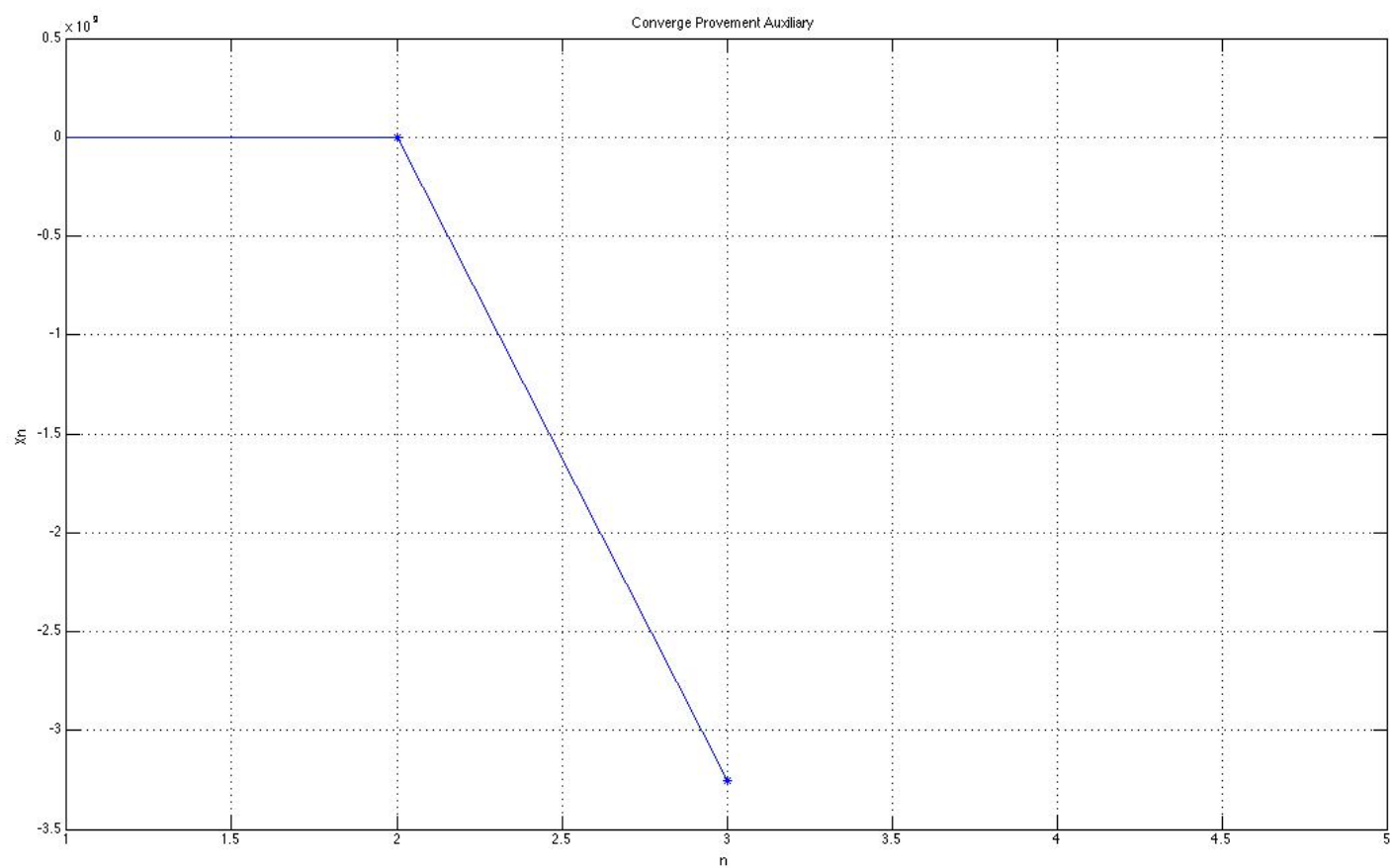


Figure 4 The non-converging plot of Newton's method with  $x_0 = -2$

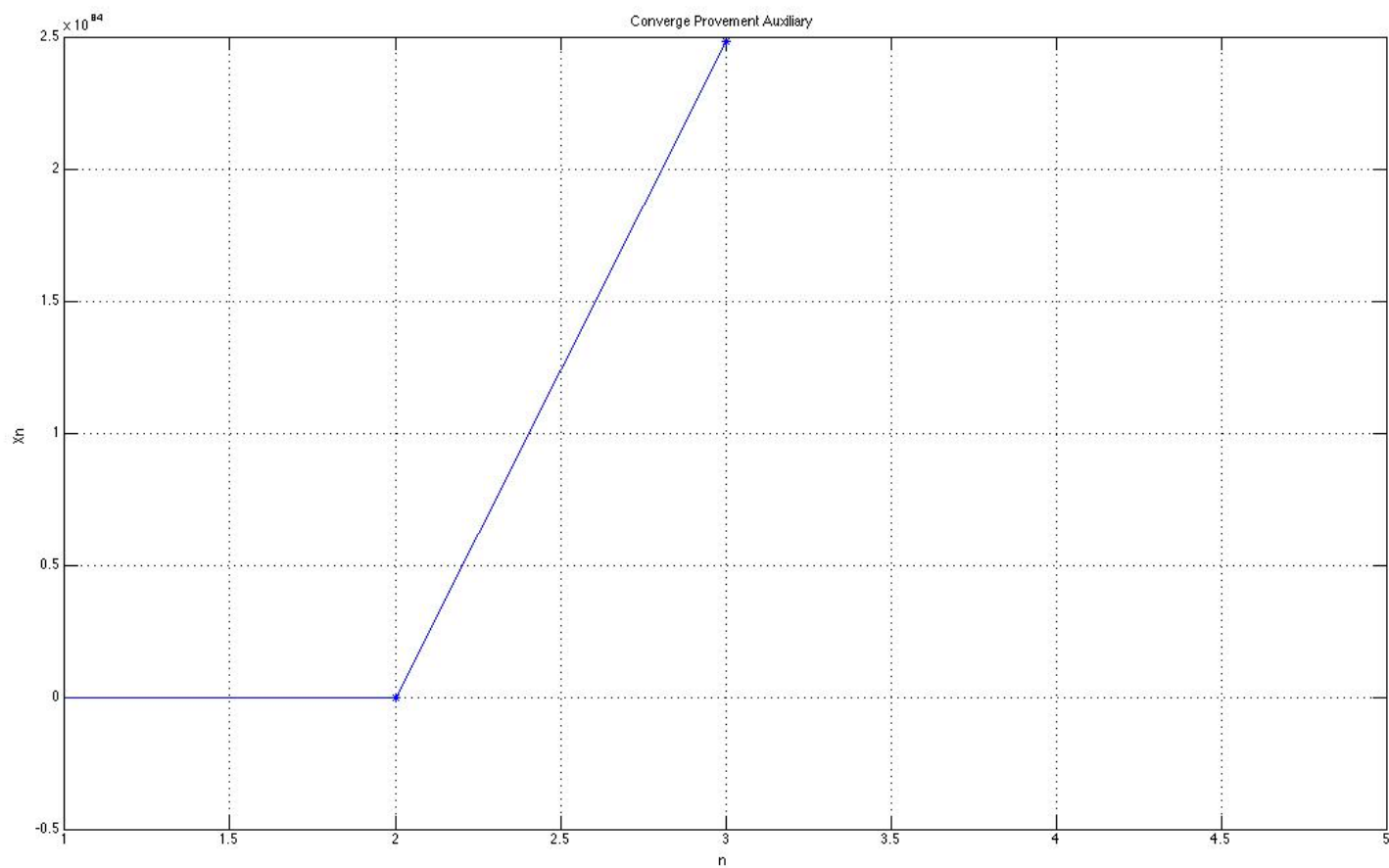


Figure 5 The non-converging plot of Newton's method with  $x_0 = 3$

The source code for (f):

```
n = 10;
x = 1 : 1 : n;
xn = zeros(1, n);
xn(1) = -2;
for i = 2 : n
    xn(i) = xn(i - 1) - tanh(xn(i - 1));
end
plot(x, xn, '*-');
grid on;
title('Converge Provement Auxiliary');
xlabel('n');
ylabel('Xn');
```

```
n = 10;
x = 1 : 1 : n;
xn = zeros(1, n);
xn(1) = 3;
for i = 2 : n
    xn(i) = xn(i - 1) - tanh(xn(i - 1));
end
plot(x, xn, '*-');
grid on;
title('Converge Provement Auxiliary');
xlabel('n');
ylabel('Xn');
```

The source code for (g):

```
n = 5;
x = 1 : 1 : n;
xn = zeros(1, n);
xn(1) = -2;
for i = 2 : n
    xn(i) = xn(i - 1) - tanh(xn(i - 1)) / sech(xn(i - 1)) ^ 2;
end
plot(x, xn, '*-');
grid on;
title('Converge Provement Auxiliary');
xlabel('n');
ylabel('Xn');
```

```
n = 5;
x = 1 : 1 : n;
xn = zeros(1, n);
xn(1) = 3;
for i = 2 : n
    xn(i) = xn(i - 1) - tanh(xn(i - 1)) / sech(xn(i - 1)) ^ 2;
end
plot(x, xn, '*-');
grid on;
title('Converge Provement Auxiliary');
```

```
xlabel('n');  
ylabel('Xn');
```

The source code for (k):

```
n = 10;  
x = 1 : 1 : n;  
xn = zeros(1, n);  
xn(1) = 2;  
g = zeros(1, n);  
for i = 2 : n  
    temp = 0;  
    temp1 = 0;  
    for j = 1 : 10  
        temp = temp + tanh(xn(i - 1) + j ^ -0.5);  
        temp1 = temp1 + log(cosh(xn(i - 1) + j ^ -0.5));  
    end  
    xn(i) = xn(i - 1) - 0.1 * temp;  
    g(i - 1) = temp1 * 0.1;  
end  
g(n) = g(n - 1);  
h = plot(x, g, '*-');  
grid on;  
title('Converge Provement G(k) Auxiliary');  
xlabel('n');  
ylabel('G(k)');
```