1. (a)

∵ x ∈ [0, 1]

∴ g(x) ∈ [3/4, 1]

∴ g(x) ∈ [0, 1]

∵ g’(x) = -x/2

∴ |g’(x)| <= 1/2 < 1

∴ unique fixed point

(b)

∵ x ∈ [0, 1]

∴ g(x) ∈ [1/2, 1]

∴ g(x) ∈ [0, 1]

∵ g’(x) = -2^(-x)\*ln(2)

∴ |g’(x)| <= ln(2) < 1

∴ unique fixed point

(c)

∵ x ∈ [0.5, 5.2]

∴ g(x) ∈ [5/26, 2]

∴ g(x) !∈ [0.5, 5.2]

∴ no fixed point

4. ∵ x = g(x)

∴ x = +-2

∵ g’(x) = 2\*x+1

∴ |g’(x)| > 1 on x∈[-3, -1]

∴ not converge to P = -2

∵ |g’(x)| > 1 on x∈[1, 3]

∴ not converge to P – 2

5. ∵ x = g(x)

∴ x = 2\*k\*pi (k∈Z)

∵ g’(x) = cos(x)-x\*sin(x)

∵ g’(2\*k\*pi) = 1

∴ 不存在K使|g’(x)| <= K < 1 on x∈D(2\*k\*pi∈D)

4.

//f.m

function [y] = f(x)

y = exp(x) - 2 - x;

end

//untitled.m

a = -2.4;

b = -1.6;

for i = 1:4

c = b - f(b) \* (b - a) / (f(b) - f(a))

if (f(c) > 0 && f(a) < 0) || (f(c) < 0 && f(a) > 0)

b = c;

elseif (f(c) > 0 && f(b) < 0) || (f(c) < 0 && f(b) > 0)

a = c;

elseif (f(c) == 0)

break;

end

end

∴ -1.8301, -1.8409, -1.8414, -1.8414

9. (a)

∵ f(3) > 0, f(7) > 0

∴ 无法开始

(b)

//g.m

function [y] = g(x)

y = 1 / (x - 2);

end

//untitled2.m

a = 1;

b = 7;

for i = 1:100

c = (a + b) / 2

if (g(c) > 0 && g(a) < 0) || (g(c) < 0 && g(a) > 0)

b = c;

elseif (g(c) > 0 && g(b) < 0) || (g(c) < 0 && g(b) > 0)

a = c;

elseif (g(c) == 0)

break;

else

break;

end

end

∵ f(1) < 0, f(7) > 0, f不连续

∵ 最后a, b, c都是2

∴ 无法结束

11.

//untitled3.m

a = 2;

b = 7;

d = 5e-9;

N = ceil((log(b - a) - log(d)) / log(2))

∴ 30

12.(a)

∵ f(x)=x^3–3\*x-2

∴ f’(x)=3\*x^2-3

∴ p(k) = p(k-1)–f(p(k-1))/f’(p(k))

(b)

//h.m

function [y] = h(x)

y = x - (x ^ 3 - 3 \* x - 2) / (3 \* x ^ 2 - 3);

end

//untitled4.m

p = 2.1;

for i = 1:4

p = h(p)

end

∴p1 = 2.0061, p2 = 2.0000, p3 = 2.0000, p4 = 2

(c)

∵ f(x)=x^3–3\*x-2=(x+1)(x^2-x-2)=(x+1)(x+1)(x-2)

∴ x = 2 is a simple root

∴ quadratic

8.

//e.m

function [y] = e(x)

y = x ^ 2 - 2 \* x - 1;

end

//untitled5.m

p(1)=2.6;

p(2)=2.5;

for i = 3:10

p(i)=p(i-1)-f(p(i-1))\*(p(i-1)-p(i-2))/(f(p(i-1))-f(p(i-2)));

end

2.60000000000000 , 2.50000000000000, 1.84962687831745, 1.53443430167933 , 1.28645194021969, 1.17916808556119, 1.14936343509181 , 1.14626875095501, 1.14619339590106, 1.14619322063029

∴ 1.14619322063029