```
% RUNNING CODE FOR PROBLEM 5

function result = runner(f, act, tol)
    result = 1;
    while abs(f(result) - act) > tol
        result = result + 1;
    end
end


%>> runner(@ex_2_2_p5, 21^(1/3), 1e-5)
%
%ans =
%
%     7
%
%>> runner(@ex_2_2_p5d, 21^(1/3), 1e-5)
%
%ans =
%
%    19


```

```
% PROBLEM 6A FROM EXERCISE 2.3

function r = ex2_3_p6a(f, df, p0, tol)
    if abs(f(p0) - 0) < tol
        r = p0;
    else
        p0 = p0 - f(p0) / df(p0);
        r = ex2_3_p6a(f, df, p0, tol);
    end
end


%>> f = @(x) exp(x) + 2^(-x) + 2*cos(x) - 6
%
%f =
%
%  function_handle with value:
%
%    @(x)exp(x)+2^(-x)+2*cos(x)-6
%
%>> df = @(x) exp(x) - (2^(-x))*log(2) - 2*sin(x)
%
%df =
%
%  function_handle with value:
%
%    @(x)exp(x)-(2^(-x))*log(2)-2*sin(x)
%
%>> ex2_3_p6a(f, df, 1.5, 1e-5)
%
%ans =
%
%   1.829383614494166


% PROBLEM 18 FROM EXERCISE 2.3
%>> f = @(x) 0.5 + (x^2)*0.25 - x*sin(x) - 0.5*cos(2*x)
%
%f =
%
%  function_handle with value:
%
%    @(x)0.5+(x^2)*0.25-x*sin(x)-0.5*cos(2*x)
%
%>> df = @(x) 0.5*x - (sin(x) + x*cos(x)) + sin(2*x)
%
```

```
%df =
%
%  function_handle with value:
%
%    @(x)0.5*x-(sin(x)+x*cos(x))+sin(2*x)
%
%>> ex2_3_p6a(f, df, pi/2, 1e-5)
%
%ans =
%
%   1.892489624534230
%
%>> ex2_3_p6a(f, df, 5*pi, 1e-5)
%
%ans =
%
%   1.892789801826626
%
%>> ex2_3_p6a(f, df, 10*pi, 1e-5)
%
%ans =
%
%   1.897842212555557
```

```m
% PROBLEM 8A FROM EXERCISE 2.3

function r = ex2_3_p8a(f, p0, p1, tol)
    if abs(f(p1) - 0) < tol
        r = p1;
    else
        p2 = p1 - (f(p1)*(p1 - p0)) / (f(p1) - f(p0));
        r = ex2_3_p8a(f, p1, p2, tol);
    end
end


%>> f = @(x) exp(x) + 2^(-x) + 2*cos(x) - 6
%
%f =
%
%  function_handle with value:
%
%    @(x)exp(x)+2^(-x)+2*cos(x)-6
%
%>> ex2_3_p8a(f, 1.5, 1.75, 1e-5)
%
%ans =
%
%   1.829383662436248
```

File - /Users/monishwaran/Desktop/math128A/MATLAB_code/EX2_2/HW3/ex_2_2_p5.m

```
% PROBLEM 5B FROM EX 2.2
function p_n = ex_2_2_p5(n)
    % BASE CASE
    if n == 0
        p_n = 1;
    else
        p_n = ex_2_2_p5(n-1) -  ((ex_2_2_p5(n-1)^3 - 21) / (3 * (ex_2_2_p5(n-1)^2)));
    end
end
```

File - /Users/monishwaran/Desktop/math128A/MATLAB_code/EX2_2/HW3/ex_2_2_p13.m

```
% PROBLEM 13A FROM EXERCISE 2.2
function n = ex_2_2_p13(g, p0, tol)
    n = 1;
    while abs(g(p0) - p0) > tol
        p0 = g(p0);
        n = n + 1;
    end
end


```

```
function p_n = ex_2_2_p5d(n)
    if n == 0
        p_n = 1;
    else
        p_n = (21 / ex_2_2_p5d(n-1))^0.5;
    end

```