

Solutions to Week 2 exercises

Contents

- [Exercise Set 1](#)
- [Exercise set 2](#)
- [Exercise set 3](#)

Exercise Set 1

```
% (a)
f = @(x) x.^2.*cos(pi*x).*exp(-x.^2);
f(4)
ezplot(f,[-5,5])
```

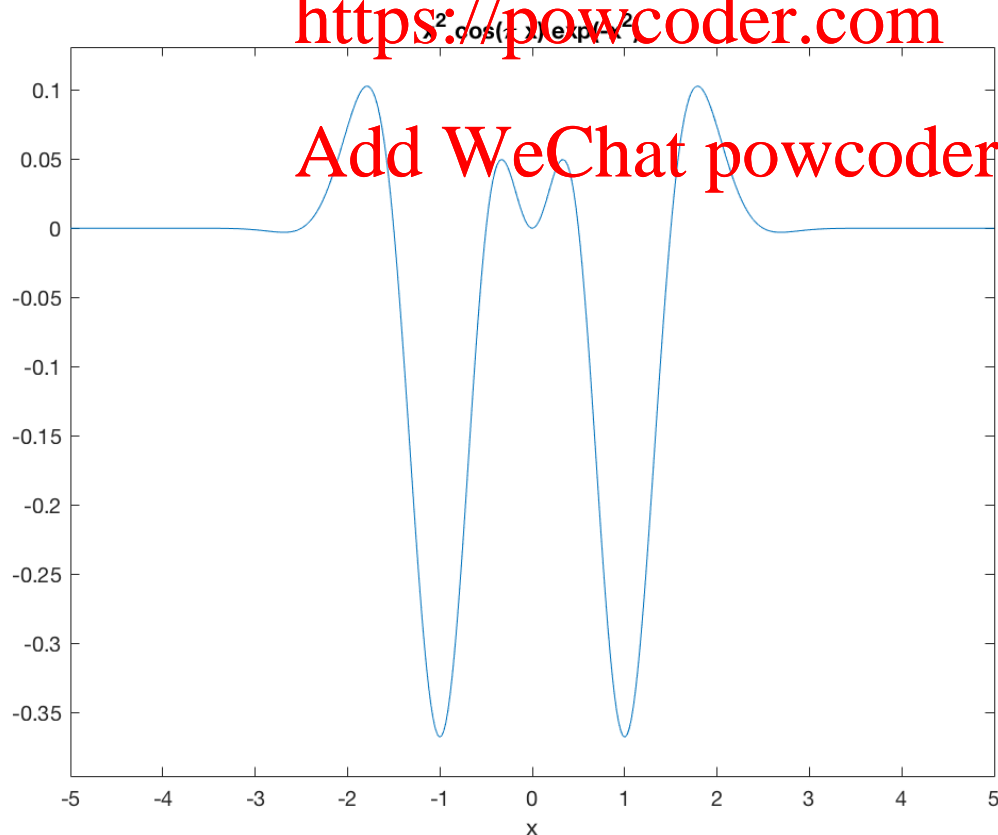
ans =

1.8006e-06

Assignment Project Exam Help

<https://powcoder.com>

Add WeChat powcoder



(b)

```

abstol = @(x1,x2,tol) abs(x1-x2) < tol;
reltol = @(x1,x2,tol) abs(x1-x2) < tol*max(abs(x1,x2));

```

```

%(c)

```

```

type myiterator

```

```

function [ fixedPoint,flag ] = myiterator( func, criterion, x0 ,tol )
%MYITERATOR A mega-iterator
%   performs fixed point iterations on a function
%   input:  func    function handle for the function to be iterated
%           i.e. xpl = func(x)
%           criterion function handle to a logical valued function
%               that gives the convergence criterion for stopping the
%               iteration
%           x0    the initial guess
%           tol   the tolerance (used in the criterion)
MAXITS = 10;
flag = 1;      % default to indicate convergence

```

```

x = x0;
xpl = func(x);
count = 1;

```

```

while ~criterion(x,xpl,tol) && (count < MAXITS)
    x = xpl;
    xpl = func(x);
    count = count +1;
end
if count >= MAXITS
    flag = 0;
    fixedPoint = nan;
else
    fixedPoint = xpl;
end

```

(d)

```

type ExleDriver

```

```

ExleDriver

```

Assignment Project Exam Help

<https://powcoder.com>

Add WeChat powcoder

```
function ExleDriver( )
%EX1E A driver for Exle
% Detailed explanation goes here

newtonRoot5 = @(x) x/2+5/(2*x);
abstol = @(x1,x2,tol) abs(x1-x2) < tol;
reltol = @(x1,x2,tol) abs(x1-x2) < tol*max(abs(x1,x2));

[root,flag] = myiterator(newtonRoot5,abstol,2,1e-10)

root =

    2.2361

flag =

    1
```

Assignment Project Exam Help

(e)

```
type NewtonSquareRoot
NewtonSquareRoot(2,5)
NewtonSquareRoot(2)
NewtonSquareRoot(2,10)
```

<https://powcoder.com>

Add WeChat powcoder

```
function [root,count] = NewtonSquareRoot(x0,a)
% A function to compute the square root of a
% Uses Newton's method
% Now with a while loop
% Input:    x0        the initial guess
%           a         the number to find the square root of
%           default value : 5
% Output:   root       the estimate of the root
%           count      the number of iterations required
% Usage:    [root, count] = NewtonSquareRoot(2,9)
%
if nargin < 2
    a = 5;          % default value
end
if x0 == 0
    disp('Error: zero not allowed as input');
    root = nan;     % give return value
    return
else
```

```

xold = x0;          % initialize xold
count = 1;          % initialize count
xnew = xold/2+a/(2*xold); % do 1 iteration before test
while abs(xnew^2-a) >= 1e-10
    xold = xnew;
    xnew = xold/2+a/(2*xold);
    count = count + 1;
end
root = xnew;
end
end

```

```

ans =

    2.2361

```

```

ans =

    2.2361

```

```

ans =

    3.1623

```

Assignment Project Exam Help

<https://powcoder.com>

Exercise set 2

no answers - just for python devotees

Add WeChat powcoder

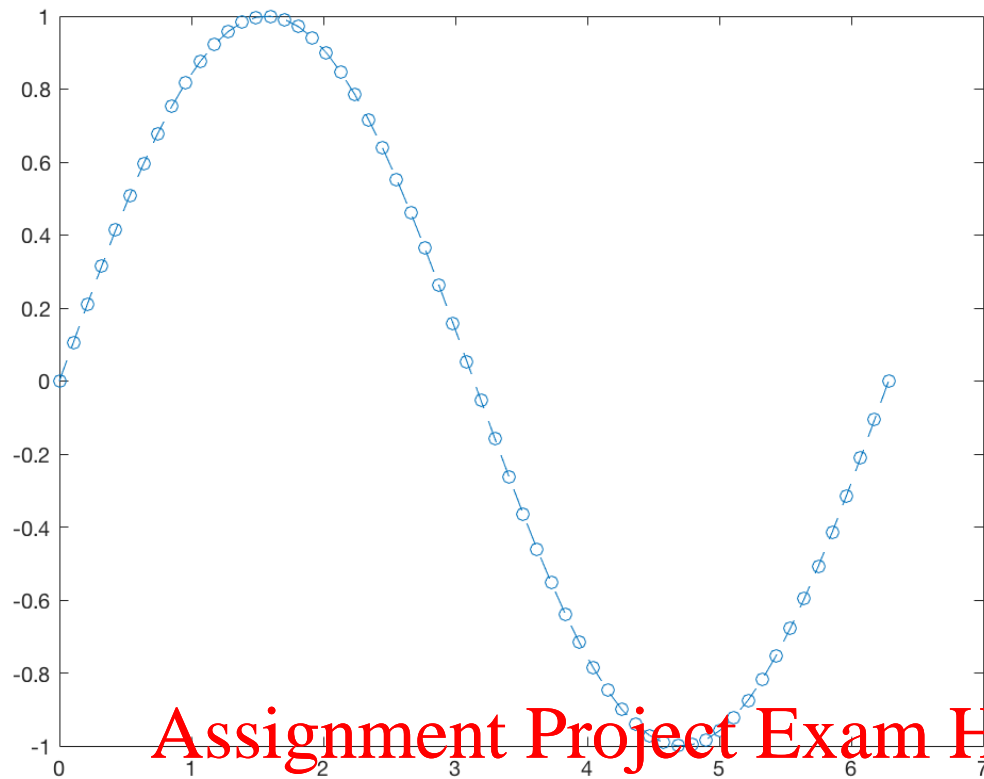
Exercise set 3

(a)

```

clf;                % clears the current figure window
theta = linspace(0,2*pi,60);
y = sin(theta);
plot(theta,y,'--o');

```



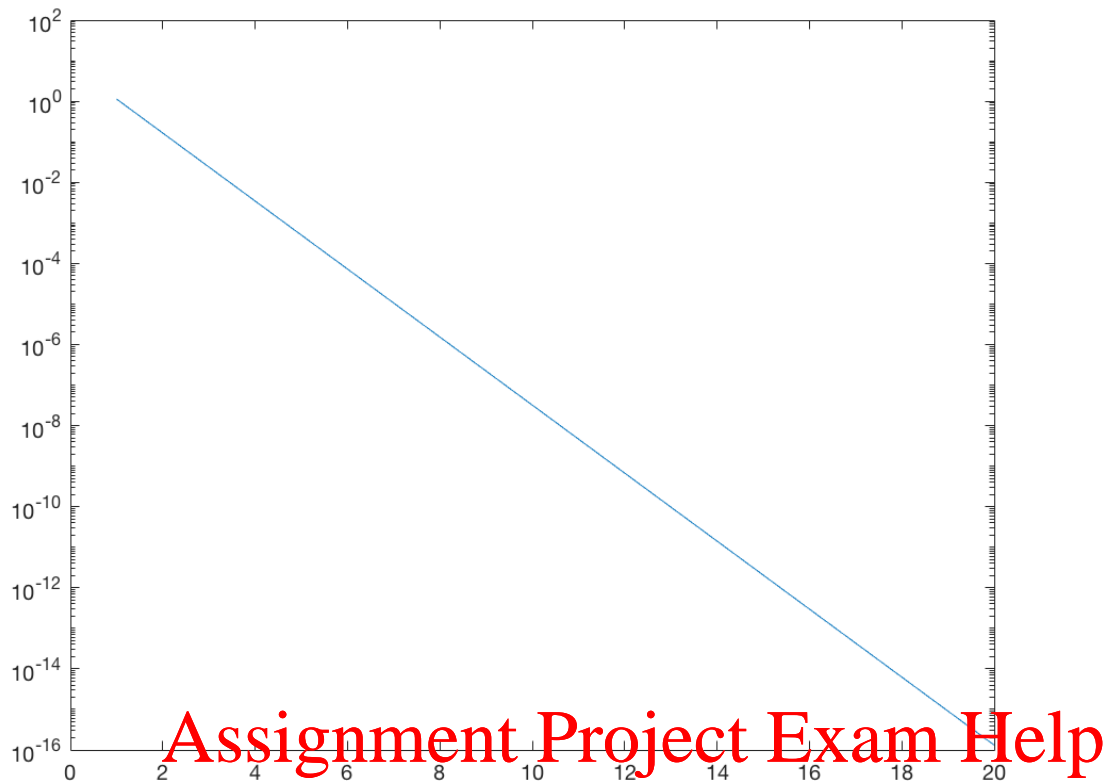
Assignment Project Exam Help

<https://powcoder.com>

(b)

```
clf
n = 1:20;
p = 0.145;           % for example
y = 7.8*p.^n;
semilogy(n,y);
```

Add WeChat powcoder

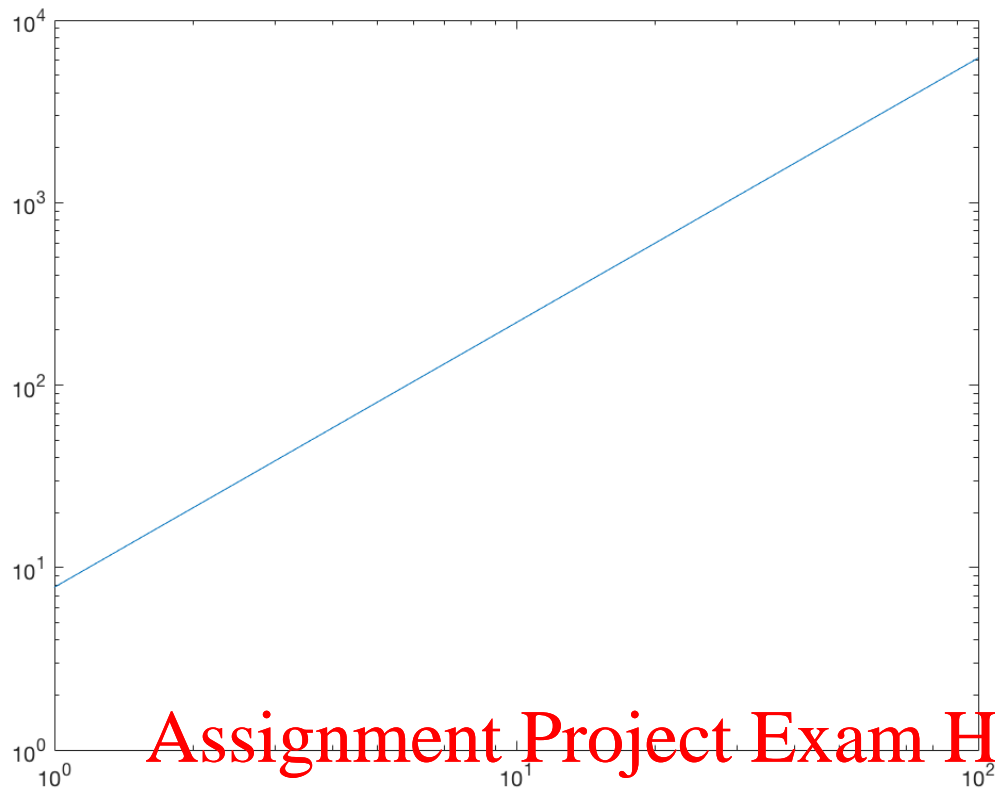


<https://powcoder.com>

(c)

Add WeChat powcoder

```
clf
n = 1:100;
p = 1.45;      % for example
y = 7.8*n.^p;
loglog(n,y);
```



Assignment Project Exam Help

<https://powcoder.com>

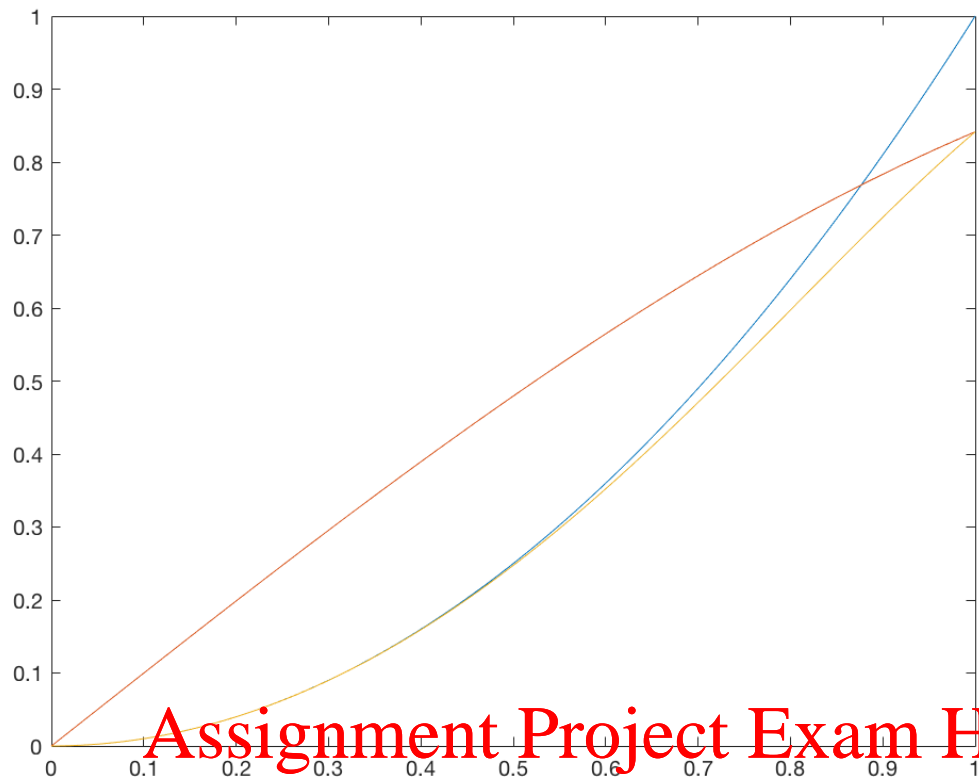
(d)

Add WeChat powcoder

```
clf
x = linspace(0,1);
y1=x.^2; y2 = sin(x);y3 = sin(y1);
plot(x,y1,x,y2,x,y3); % or use `hold on'

% easier to put labels on using the Plotting tools in the figure window
% Insert -> TextArrow
% then Save As ... your favourite graphics format - here .fig

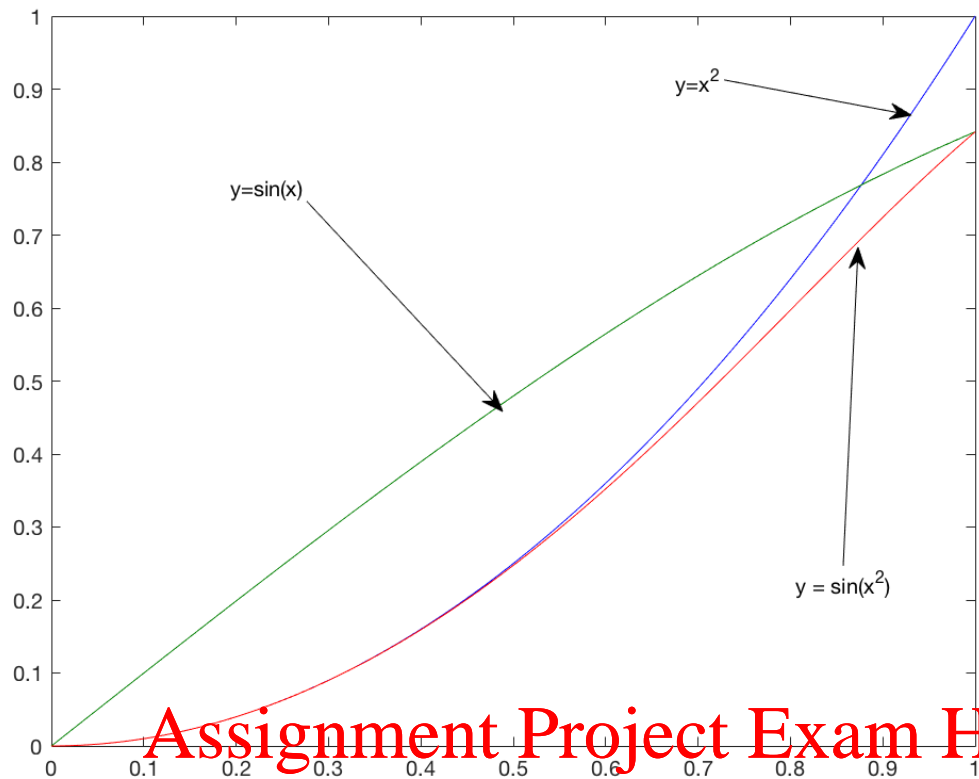
open('Ex3d.fig');
```



Assignment Project Exam Help

<https://powcoder.com>

Add WeChat powcoder



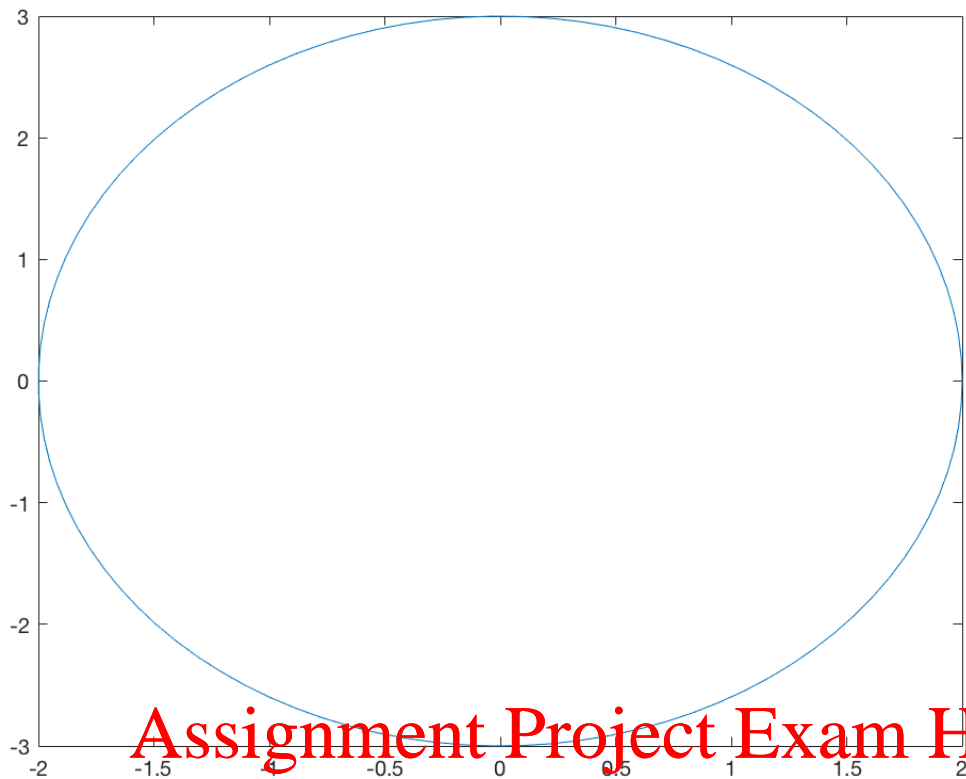
Assignment Project Exam Help

<https://powcoder.com>

(e)

```
clf
a= 2; b = 3;
t = linspace(0,2*pi);
x = a*cos(t); y = b*sin(t);
plot(x,y);
```

Add WeChat powcoder



Assignment Project Exam Help

<https://powcoder.com>

Published with MATLAB® R2016b

Add WeChat powcoder