

# Daniel Hondal

## HW 8B: Problem 4

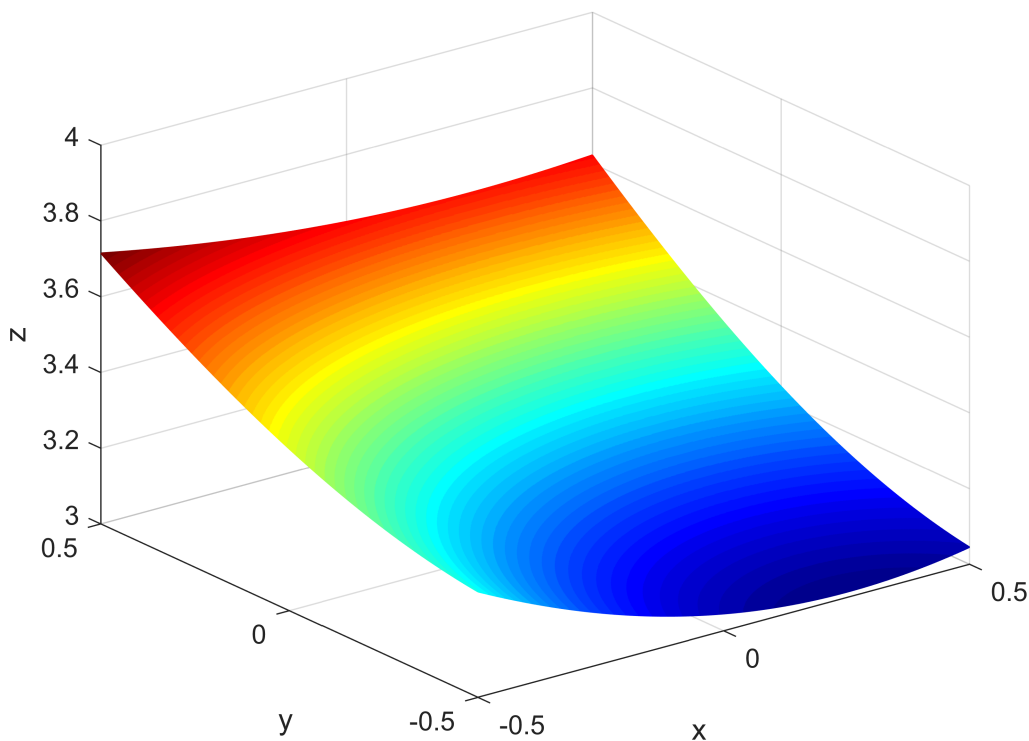
### Part A: Mesh

```
z = @(x,y) cos(x-0.25).*sin(y-0.9)+4
```

```
z = function_handle with value:
```

```
@(x,y)cos(x-0.25).*sin(y-0.9)+4
```

```
x = linspace(-.5,.5,1e3);  
y = x;  
[X, Y] = meshgrid(x,y);  
  
mesh(X,Y,z(X,Y));  
axis([-0.5 0.5 -0.5 0.5 3 4])  
xlabel('x','fontsize',14);  
ylabel('y','fontsize',14);  
zlabel('z','fontsize',14);  
colormap('jet'); % set colors to blue low and red high  
set(gca,'fontsize',10);
```



### Part B: Volume

```
% Area of
r = 0.5;
A = pi*r^2
```

```
A = 0.7854
```

```
truval = A*integral2( @(x,y) z(x,y),-0.5,0.5,-0.5,0.5)
```

```
truval = 2.5935
```

```
xt = -0.5 + 0.5*rand(1e6,1);
yt = -0.5 + 0.5*rand(1e6,1);
xt = [xt; 0.5-xt-0.5]; % antithetic sampling
yt = [yt; 0.5-yt-0.5]; % antithetic sampling
F = A* z(xt,yt);
```

```
Fs = cumsum(F);
Ie = 1*Fs./(1:length(Fs))';
semilogx(abs(Ie-truval)/truval,'k-');
grid on;
ylabel('Percent Error')
xlabel('Samples')
```

