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%Ryan Plante
%ECE498 Homework 8
%4/2/2018
```

Question 1

```
%a
y = dsolve('Dy = ((x^2)/y)', 'x');
fprintf('Solution (1a): \n')
disp(y)

%b
y = dsolve('Dy + y^2 * sin(x) = 0', 'x');
fprintf('Solution (1b): \n')
disp(y)

%c
y = dsolve('x*Dy = sqrt(1- y^2)', 'x');
fprintf('Solution (1c): \n')
disp(y)

Solution (1a):
      2^(1/2)*(x^3/3 + C2)^(1/2)
     -2^(1/2)*(x^3/3 + C2)^(1/2)

Solution (1b):
      0
     -1/(C5 + cos(x))

Solution (1c):
      1
     -1
    sin(C8 + log(x))
```

Question 2

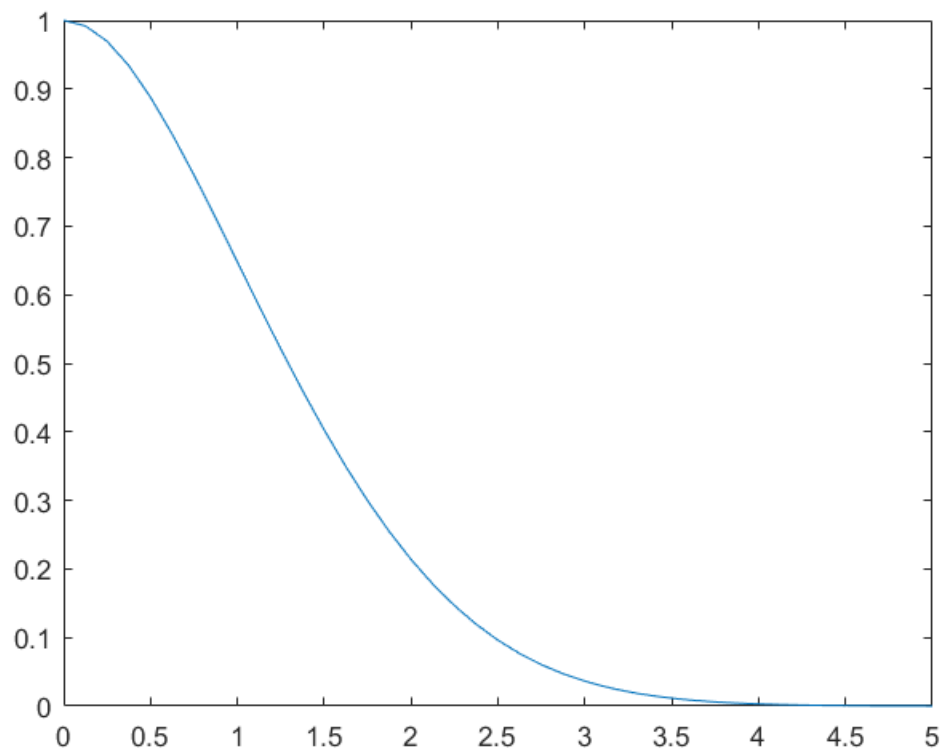
```
%a
f = inline('(-x*y)/(sqrt(2-y^2))');
[x, y] = ode45(f, [0 5], 1);
plot(x,y)

%b

%dy1/dx = 2*y1 + y2 + 5*y3 + e^(-2*x)
%dy2/dx = -3*y1 - 2*y2 - 8*y3 + 2*e^(-2*x)-cos(3*x)
%dy3/dx = 3*y1+3*y2+2*y3+cos(3*x)
%y1(0) = 1
%y2(0) = -1
%y3(0) = 1
% x [0, pi/2]
```

```
%For some reason I cannot get this to work
% y0 = [1 -1 1];
% xvals = [0 pi/2];
% [x,y] = ode23(@diffeq, xvals, y0);
```

```
function yprime = diffeq(x,y)
    yprime = [2*y(1) + y(2) + 5*y(3) + exp(-2*x); ...
              -3*y(1) -2*y(2) -8*y(3) +2*exp(-2*x)-cos(3*x); ...
              +3*y(1) + 3*y(2) + 2*y(3) + cos(3*x)];
end
```



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