```
% P_R = P_T + G_T + G_R - 20log(4*pi/lambda) - 20 log(r)
% Gain of transmitter and receiver is 0 dBi for the RFID tags
lambda = 3*10^8/(1*10^9); %.3 meters
x_location = [];
y_location = [];
P_T = 17;
P_R = -85;
G_T = 0;
G_R = 0;
c = 3*10^8;

r = 10^((-85-17)/-40) * (lambda/(4*pi)); %max RFID distance
r = 10^((-82-17)/-40) * (lambda/(4*pi)); %RFID distance to drop new
breadcrumb
r = 10^((-79-17)/-40) * (lambda/(4*pi));%off by 3 dB
delta_meters = 10^((-82-17)/-40) * (lambda/(4*pi)) - r; %.2 meter accuracy

%distance from lander to first breadcrumb
lambda = 3*10^8/(2.45*10^9);
r = 10^((-49+46 -2*32 -2*32)/-40) * (lambda/(4*pi));%~18 meters or 60 ft.

% Location stuff
lambda = 3*10^8/(1*10^9); %.3 meters for 1 GHz
r = 10^((-82-17)/-40) * (lambda/(4*pi));
x_location(1) = 0;
y_location(1) = 0;
N=256;
t=(0:N)*2*pi/N;
plot(x_location, y_location, 'x')
hold on
plot( r*cos(t)+x_location, r*sin(t)+y_location);
for j = 2:200
   x_add = rand(1,1)*7;
   y_add = sqrt(r^2 - x_add^2);
   if (rand(1) < .5)
       y_add = -1*y_add;
   end
   x_location(j) = x_location(j-1) + x_add + sqrt(4.39)*randn(1);
   y_location(j) = y_location(j-1) + y_add + sqrt(4.39)*randn(1);
   plot(r*cos(t)+x_location(j), r*sin(t)+y_location(j));
   tau_B = sqrt((x_location(j)-x_location(j-1)+.1)^2 + (y_location(j)-
y_location(j-1))^2) - sqrt((x_location(j)-x_location(j-1))^2 +
(y_location(j)-y_location(j-1))^2);
   tau_C = sqrt((x_location(j)-x_location(j-1)+.05)^2 + (y_location(j)-
y_location(j-1)*.05*sqrt(3))^2) - sqrt((x_location(j)-x_location(j-1))^2 +
(y_location(j)-y_location(j-1))^2);

   str_B = [num2str(tau_B) '=(1/3e8)*(sqrt((' num2str(x_location(j-1)) '-
x)^2+(' num2str(y_location(j-1)) '-y)^2)-sqrt(' num2str(x_location(j-1))
'^2+' num2str(y_location(j-1)) '^2))']
   str_C = [num2str(tau_C) '=(1/3e8)*(sqrt((' num2str(x_location(j-1)) '-
x)^2+(' num2str(y_location(j-1)) '-y)^2)-sqrt(' num2str(x_location(j-1))
'^2+' num2str(y_location(j-1)) '^2))']

   line([x_location(j) x_location(j-1)], [y_location(j) y_location(j-1)],
'color', 'red')
```

```
    syms x y
    [aa(j) bb(j)] = solve(str_B, str_C, 'x', 'y')
    line([aa(j) aa(j-1)], [bb(j) bb(j-1)], 'color', 'red')
end
plot(x_location, y_location, 'x');
```