```matlab
% initialize variables
L = 850;
E = 57000;
I = 23000;
w = 2.5;
f = @beam;
df = @dbeam;
xt = L/sqrt(5);
err = 0.005;
[xmax, n] = falsePositionKnown(L,df,xt,err);
xmax
ymax = beam(L,E,I,w,xmax)
n


function [xmax, n] = falsePositionKnown(L,f,xt,err)

% initialize (x,y) test points (left, right)
xl = 0;
yl = f(xl,L);
xr = L;
yr = f(xr,L);

% set first test point at L/2
xm = L/2;
ym = f(xm,L);

% count for number of iterations
n = 1;
while xm > (1+err)*xt || xm < (1-err)*xt
    if yl*ym < 0 % left side of zero
        xr = xm;
        yr = ym;
    elseif ym*yr < 0
        xl = xm;
        yl = ym;
    else
        % if there are no zeros on either side
        disp('error: no findable zeros via this method!');
        break
    end
    s = (yr-yl)/(xr-xl);
    xm = -yr/s + xr;
    ym = f(xm,L);
    n = n+1;
end
xmax = xm;
end

function y = beam(L,E,I,w,x)
y = w/(120*E*I*L)*(-x^5 + 2*L^2*x^3 - L^4*x);
end

function y = dbeam(x,L)
y = -5*x^4 + 6*L^2*x^2 - L^4;
end
```

```
xmax =

   380.2136


ymax =

   -2.3743


n =

      3
```