```
%Homework 10
%This script is used to find the mole fraction (x) of water (H2O) that
%dissociates. The script used the falsePosition function to find the root
%for the givin equation. The user will need to define k and pt to run the
%script.
%Created 2-22-2018
%Author: Corbyn Berg
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```
%Define variables for the equation
k = 0.05;   %k is the constant for the reaction's equilibrium, and it is unitless.
pt = 3;     %pt is the pressure in atm of the mixture.
```

```
%Define equation that will be run. Use @(x) to set up an annonymous
%varible, becasue we do not know what x is yet.
f = @(x) x/(1-x)*sqrt((2*pt)/(2+x))-k;
```

```
%Now we plot f in order to get an idea of where the root is. This will help
%us estimate an xl and xu (lower and upper guess),so we can use this
%interval when we run falsePosition.
fplot(f)
```

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Warning: Function behaves unexpectedly on array inputs. To improve performance,
properly vectorize your function to return an output with the same size and
shape as the input arguments.
```

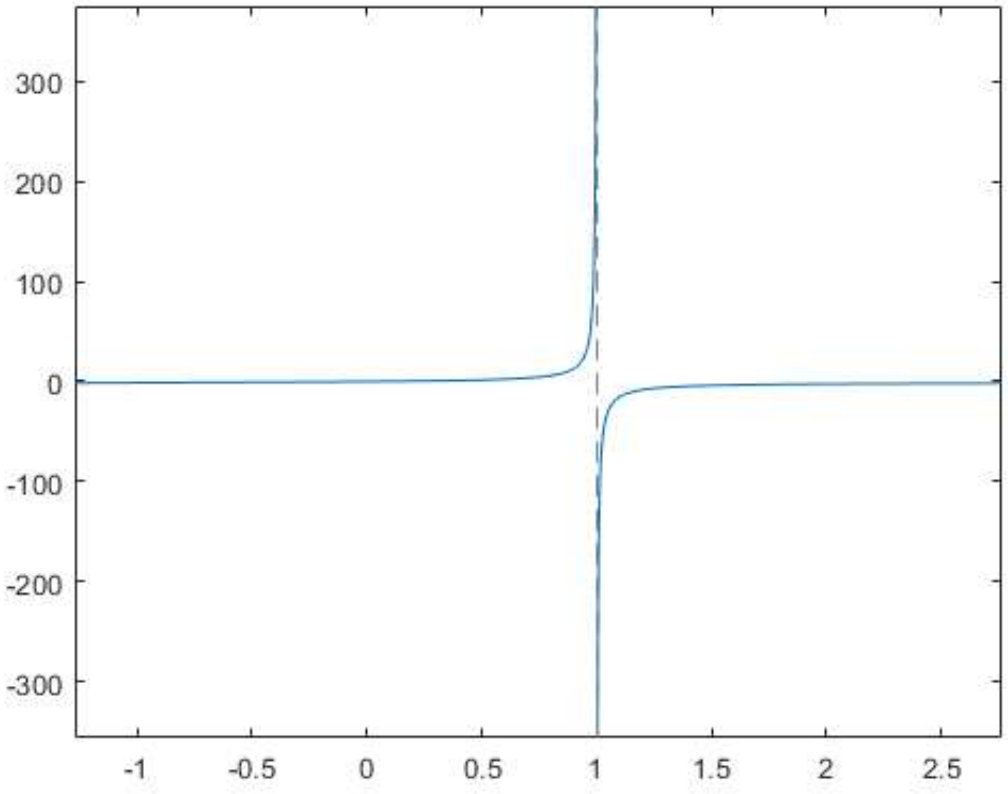


```
%Run the falsePosition function. List the outputs wanted, and also set the
%window. Because I plotted f, I could tell that the root was most likely
%near 0, so my window is small.
[root,fx,ea,iter] = falsePosition(@(x) f(x),0,0.1);
```

```
iter =

     1


iter =

     2


iter =

     3


iter =

     4


iter =
```

```
     5

iter =

     6

root =

    0.0282
```

```
%Print results
fprintf('The x value that represents the mole fraction to satisfy the equation is %3f\n',root
)
```

```
The x value that represents the mole fraction to satisfy the equation is 0.028249
```

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