

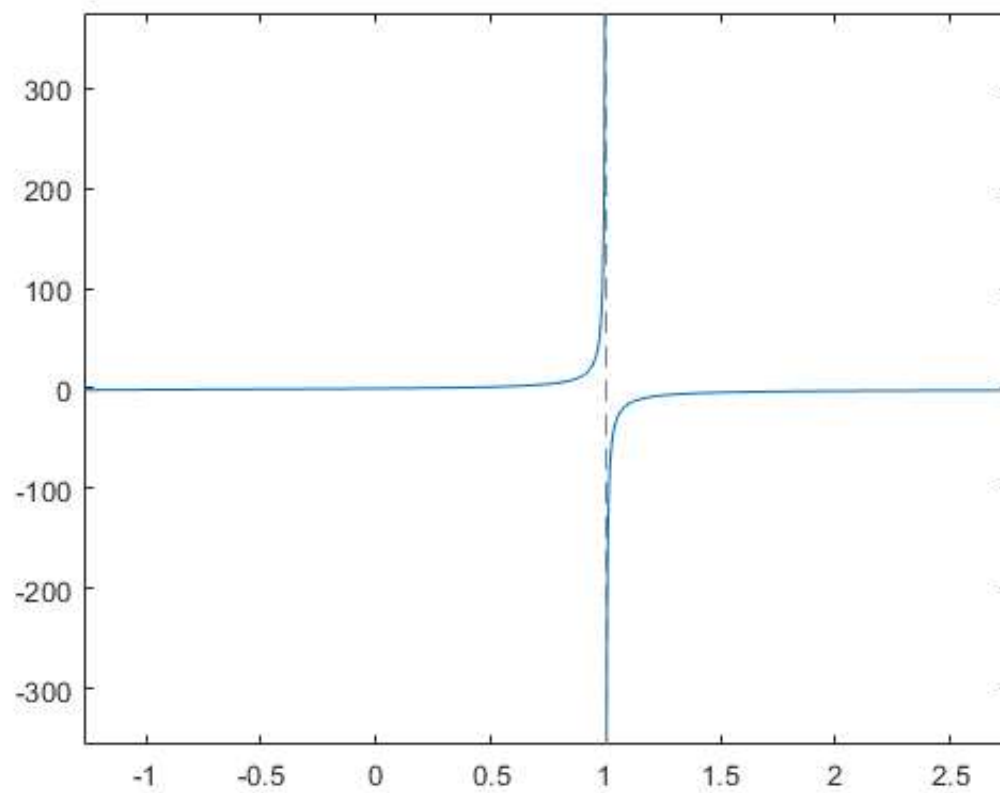
```
%Homework 10
%This script is used to find the mole fraction (x) of water (H2O) that
% dissociates. The script used the falsePosition function to find the root
% for the given equation. The user will need to define k and pt to run the
% script.
%Created 2-22-2018
%Author: Corbyn Berg
```

```
%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 anonymous
% variable, because 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)
```

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