```
function Assignment2_8
x0=[0.05,0.02]';
x =fsolve(@extenta,x0);
disp('Equilibrium Extent on Condition A is')
vpa(x,4)
x =fsolve(@extentb,x0);
disp('Equilibrium Extent on Condition B is')
vpa(x,4)
end
```

problem a:

```
function E=extenta(x) % vector x is the reaction extents of two
 reactions.
K =[0.1071;0.01493];  %Equilibrium constant
Ni=[1/3, 0, 1/3, 1/3, 0]';  % Feed mole vector
N(1) = Ni(1)-2*x(1);        % Equilibrium mole vector
N(2) = Ni(2)+2*x(1);
N(3) = Ni(3)+x(1)-x(2);
N(4) = Ni(4)-x(2);
N(5) = Ni(5)+2*x(2);
Nt = N(1)+N(2)+N(3)+N(4)+N(5);   % Totle mole
y(1) = N(1)/Nt;                  % mole fraction
y(2) = N(2)/Nt;
y(3) = N(3)/Nt;
y(4) = N(4)/Nt;
y(5) = N(5)/Nt;
E = [y(2)^2*y(3)/y(1)^2-K(1);
    y(5)^2/y(3)/y(4)-K(2)];
end
```

```
Equation solved.

fsolve completed because the vector of function values is near zero
as measured by the default value of the function tolerance, and
the problem appears regular as measured by the gradient.



Equilibrium Extent on Condition A is

ans =

 0.05931
 0.02083
```

Problem b:

```
function E=extentb(x) % vector x is the reaction extents of two
 reactions.
```

```
K =[0.1071;0.01493];  %Equilibrium constant
Ni=[2, 0, 1/3, 1/3, 0]';  % Feed mole vector
N(1) = Ni(1)-2*x(1);        % Equilibrium mole vector
N(2) = Ni(2)+2*x(1);
N(3) = Ni(3)+x(1)-x(2);
N(4) = Ni(4)-x(2);
N(5) = Ni(5)+2*x(2);
Nt = N(1)+N(2)+N(3)+N(4)+N(5);   % Totle mole
y(1) = N(1)/Nt;                  % mole fraction
y(2) = N(2)/Nt;
y(3) = N(3)/Nt;
y(4) = N(4)/Nt;
y(5) = N(5)/Nt;
E = [y(2)^2*y(3)/y(1)^2-K(1);
    y(5)^2/y(3)/y(4)-K(2)];
end
```

```
Equation solved.

fsolve completed because the vector of function values is near zero
as measured by the default value of the function tolerance, and
the problem appears regular as measured by the gradient.



Equilibrium Extent on Condition B is

ans =

   0.405
 0.02842
```

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