Question 4. On 'nwt-head.py', write your own Newton-Raphson root finder and use it to find the root of the equation in the same file.

In [1]:

```
import numpy as np
import scipy.optimize as opt
```

In [2]:

```
import matplotlib.pyplot as plt
import scipy.misc as sm
```

In [3]:

```
def f(x):
    y=2*x*x-7*x+1
    return y
```

In [5]:

```
x=np.arange(0,10,0.1)
y = 2*x*x-7*x+1
```

In [6]:

```
def Newton(f,x0,err) :
    xn = x0
    while abs(f(xn)) > err :
        tmp = xn
        xn = xn - f(xn)/sm.derivative(f,xn,dx = 1e-6)
    return xn
```

In [16]:

```
sol1 = Newton(f,1,1e-3)
sol1
```

Out[16]:

```
0.149218663276545
```

In [17]:

```
sol2 = Newton(f,10,1e-3)
sol2
```

Out[17]:

```
3.3507920991895577
```

In [13]:

```
f(sol2)
```

Out[13]:

```
7.06896554234504e-05
```

In [22]:

```
plt.plot(x,y)
plt.plot(x,0*x)
plt.scatter(sol1,f(sol1),c='r')
plt.scatter(sol2,f(sol2),c='r')
```

Out[22]:

```
<matplotlib.collections.PathCollection at 0x2ab912cf460>
```