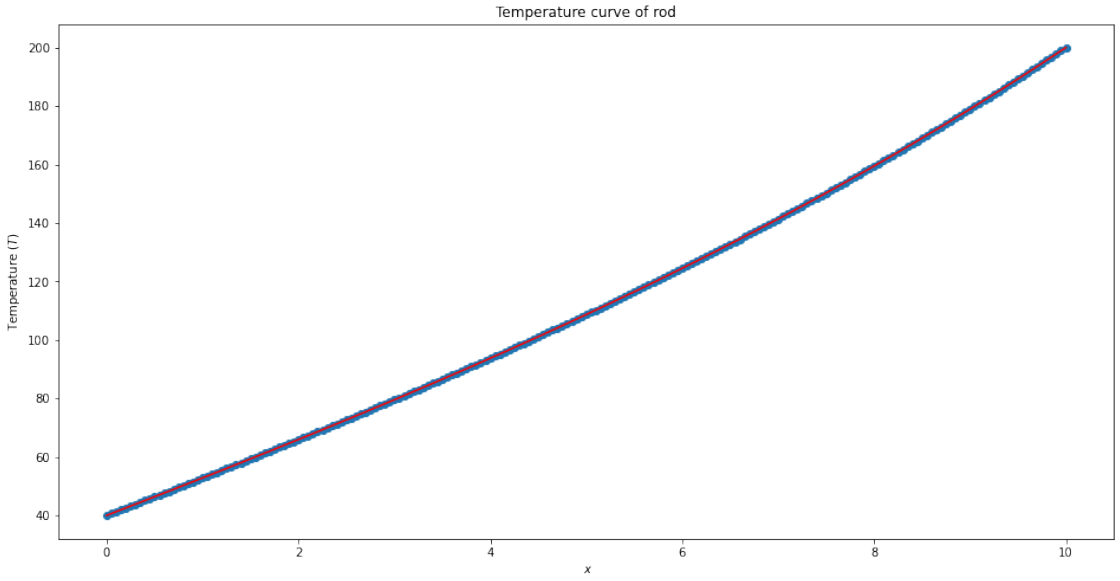
# Q5

November 21, 2021

[19]:
```
%run lib.ipynb
```

[20]:
```
#given boundary values (let temperatute be y)
x_i = 0
x_f = 10
y_i = 40
y_f = 200

# z = dy/dx

def f1(x, y, z):
    return z

def f2(x, y, z):
    return -0.01*(20-y)



x, y, z = shooting_method(f2, f1, x_i, y_i, x_f, y_f, 5, 30, h=0.05)

print(f"It is 100 degree celcius at x = {x[89]} ")
plt.figure(figsize=(16,8))
plt.ylabel("Temperature $(T)$")
plt.xlabel(" $x$")
plt.title("Temperature curve of rod")
plt.plot(x,y,'r')
plt.scatter(x,y)
plt.show()
```

```
It is 100 degree celcius at x = 4.449999999999992
```


Temperature curve of rod
Temperature (T)
x
200
180
160
140
120
100
80
60
40
0
2
4
6
8
10