oct_05_coding_prob

October 10, 2023

[ ]:
```
import numpy as np
import matplotlib.pyplot as plt

def f2(L):
   return -84/(np.sin((np.pi/2)-np.arctan(3/4))+np.sin(np.arctan(L/3))*np.
 ↪cos((np.pi/2)-np.arctan(3/4)/np.cos(np.arctan(L/3))))

def f1(L):
    return (-1* f2(L) *np.cos((np.pi/2)-np.arctan(3/4)))/np.cos(np.arctan(L/3))

def f3(L):
    return -1 * f2(L) * np.cos(np.arctan(3/4))


L = np.arange( 1.0, 3.1, 0.1)
f1_list = []
f2_list = []
f3_list = []


for i in L:
    f1_list.append(f1(i))
    f2_list.append(f2(i))
    f3_list.append(f3(i))


plt.plot(L, f1_list, label = "F1", color = "r", marker = "o")
plt.plot(L, f2_list, label = "F2", color="g", marker = "x")
plt.plot(L, f3_list, label = "F3", color = "b", marker = "s")

#adding the title and labels
plt.title("Plot of F1, F2, F3 over L")
plt.xlabel("L")
plt.ylabel("Force in kN")

#showing the legend
plt.legend()
```

```
#displaying the plot
plt.grid(True)
plt.tight_layout()
plt.show()
```