Problem 1

In [*]:
```
import numpy as np
```

In [16]:
```
def sin(theta):
    return np.sin(theta)
```

Problem 2

In [29]:
```
from scipy.optimize import minimize
```

In [30]:
```
x0 = 0
min_sin = minimize(sin, x0)
print(min_sin)
```

```
      fun: -1.0
 hess_inv: array([[0.99999811]])
      jac: array([-0.])
  message: 'Optimization terminated successfully.'
     nfev: 12
      nit: 4
     njev: 6
   status: 0
  success: True
        x: array([-1.57079632])
```

Problem 3

In [31]:
```
from scipy.integrate import quad
```

In [33]:
```
integral = quad(sin, 0, 1)
print(integral[0])
```

```
0.45969769413186023
```

Problem 4

In [34]:
```
import matplotlib.pyplot as plt
```

In [37]:
```
x = np.linspace(0, 2*np.pi, 10000)
y = sin(x)

plt.plot(x,y)
plt.title("Sin Plot")
plt.xlabel("x")
plt.ylabel("sin(x)")
plt.show()
```