```
import numpy as np
import matplotlib.pyplot as plt

def local_regression(x0, X, Y, tau):
    x0 = [1, x0]   # add bias term
    X = [[1, i] for i in X]#add one to loss of information
    X = np.asarray(X)
    W = np.diag(np.exp(-np.sum((X - x0) ** 2, axis=1) / (2 * tau * tau)))
    beta = np.linalg.pinv(X.T @ W @ X) @ X.T @ W @ Y
    y_pred = np.dot(beta, x0)
    return y_pred
def draw(tau):
# prediction through regression
    prediction = [local_regression(x0, X, Y, tau) for x0 in domain]
    plt.plot(X, Y, 'o', color='black')
    plt.plot(domain, prediction, color='red')
    plt.show()
# generate dataset
X = np.linspace(-3, 3, num=100)
domain = X
Y = np.log(np.abs(X ** 2 - 1) + .5)

print("X values are:",X)
print("Y values are:",Y)
```

```
# Plotting the curves with different tau
print("\nRegression Line Fit for different values of Tau-10,0.1,0.01,0.001")
draw(10)
draw(0.1)
draw(0.01)
draw(0.001)
```