In [10]:
```
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd

data = pd.read_csv('data/rls_data.csv')
data = data[['x1', 'x2', 'x3', 'x4', 'y']].to_numpy()
```

In [12]:
```
M = 4
N = 50

# xs = np.random.randn(M , N)
# ws = np.random.randn(M)
# ys = ws @ xs

xs = np.array([data[:, 0], data[:, 1], data[:, 2], data[:, 3],])
ys = data[:, 4]

# print(xs , ys)

x = xs.copy()
y = ys.copy()
wy = np.zeros(M)
```

In [13]:
```
for i in range(M):
    for j in range(i+1, M):
        wx = np.sum(x[j] * x[i])/np.sum(x[i]**2)
        pxj = wx * x[i]
        exj = x[j] - pxj
        x[j] = exj

for i in range(M-1, -1, -1):
    wy[i] = np.sum(y * x[i])/np.sum(x[i]**2)
    py = wy[i] * xs[i]
    ey = y - py
    y = ey

print(wy)

pred = wy @ xs
```

```
[ 1.99791723e+15 -1.99791723e+15 -1.99791723e+15 -1.99791723e+15]
```

In [14]:
```
fig, axs = plt.subplots(1, 2, figsize=(20, 10))
plt.subplot(1, 2, 1)
plt.grid()
plt.plot(ys)
plt.plot(pred)
plt.legend(["truth", "prediction"])
plt.subplot(1, 2, 2)
plt.grid()
print(ys.shape, pred.shape)
plt.plot(ys - pred)
plt.legend(["error",])
plt.show()
```

```
(78,) (78,)
```