In [81]:
```
# a) m = 30, n = 5, var_error = 0, true_w = [1,4,2,10,23]
lreg_sim(30, 5, 0, [1,4,2,10,23])
```

```
--- Pseudo Inverse ---
Normalized error: 0.0000000000
Execution time: 0.0004345000

--- Solving Normal Equations ---
Normalized error: 0.0000000000
Execution time: 0.0004782000

--- Gradient Descent ---
Normalized error: 0.0000009399
Execution time: 0.0086158000
```

In [82]:
```
# b) m = 30, n = 5, var_error = e^-6, true_w = [1,4,2,10,23]
lreg_sim(30, 5, 1e-6, [1,4,2,10,23])
```

```
--- Pseudo Inverse ---
Normalized error: 0.0000000180
Execution time: 0.0003858000

--- Solving Normal Equations ---
Normalized error: 0.0000000180
Execution time: 0.0003699000

--- Gradient Descent ---
Normalized error: 0.0000265457
Execution time: 0.0075417000
```

In [83]:
```
# c) m = 100, n = 5, var_error = e^-6, true_w = [1,4,2,10,23]
lreg_sim(100, 5, 1e-6, [1,4,2,10,23])
```

```
--- Pseudo Inverse ---
Normalized error: 0.0000000082
Execution time: 0.0008050000

--- Solving Normal Equations ---
Normalized error: 0.0000000082
Execution time: 0.0003831000

--- Gradient Descent ---
Normalized error: 0.0000000000
Execution time: 0.0092856000
```

In [84]:
```
# d) m = 1000, n = 5, var_error = e^-6, true_w = [1,4,2,10,23]
lreg_sim(1000, 5, 1e-6, [1,4,2,10,23])
```

```
--- Pseudo Inverse ---
Normalized error: 0.0000000036
Execution time: 0.0006281000

--- Solving Normal Equations ---
Normalized error: 0.0000000036
Execution time: 0.0002713000

--- Gradient Descent ---
Normalized error: 0.0000000000
Execution time: 0.0283829000
```

In [85]:
```
# e) m = 1000, n = 5, var_error = e^-4, true_w = [1,4,2,10,23]
lreg_sim(100, 5, 1e-4, [1,4,2,10,23])
```

```
--- Pseudo Inverse ---
Normalized error: 0.0000008777
Execution time: 0.0007179000

--- Solving Normal Equations ---
Normalized error: 0.0000008777
Execution time: 0.0003558000

--- Gradient Descent ---
Normalized error: 0.0000000000
Execution time: 0.0078567000
```

In [ ]:
```
# Question 2:
```

In [2]:
```
data = open(r"E:\IASTATE\EE425\Homework\homework_EE425\airfoil_self_noise.dat"
)
```