Electric Potential in 1D – Excel Lab

Charge A:

q_A =	-1.6E-08	(C)
x_A =	-11.0	(m)
y_A =	0.0	(m)

Charge B:

q_B =	3.8E-08	(C)
x_B =	15.0	(m)
y_B =	0.0	(m)

Constants:

k =	9E+09	($N \cdot m^2/C^2$)

Range: Left		
Δx_L =	4.5	(m)

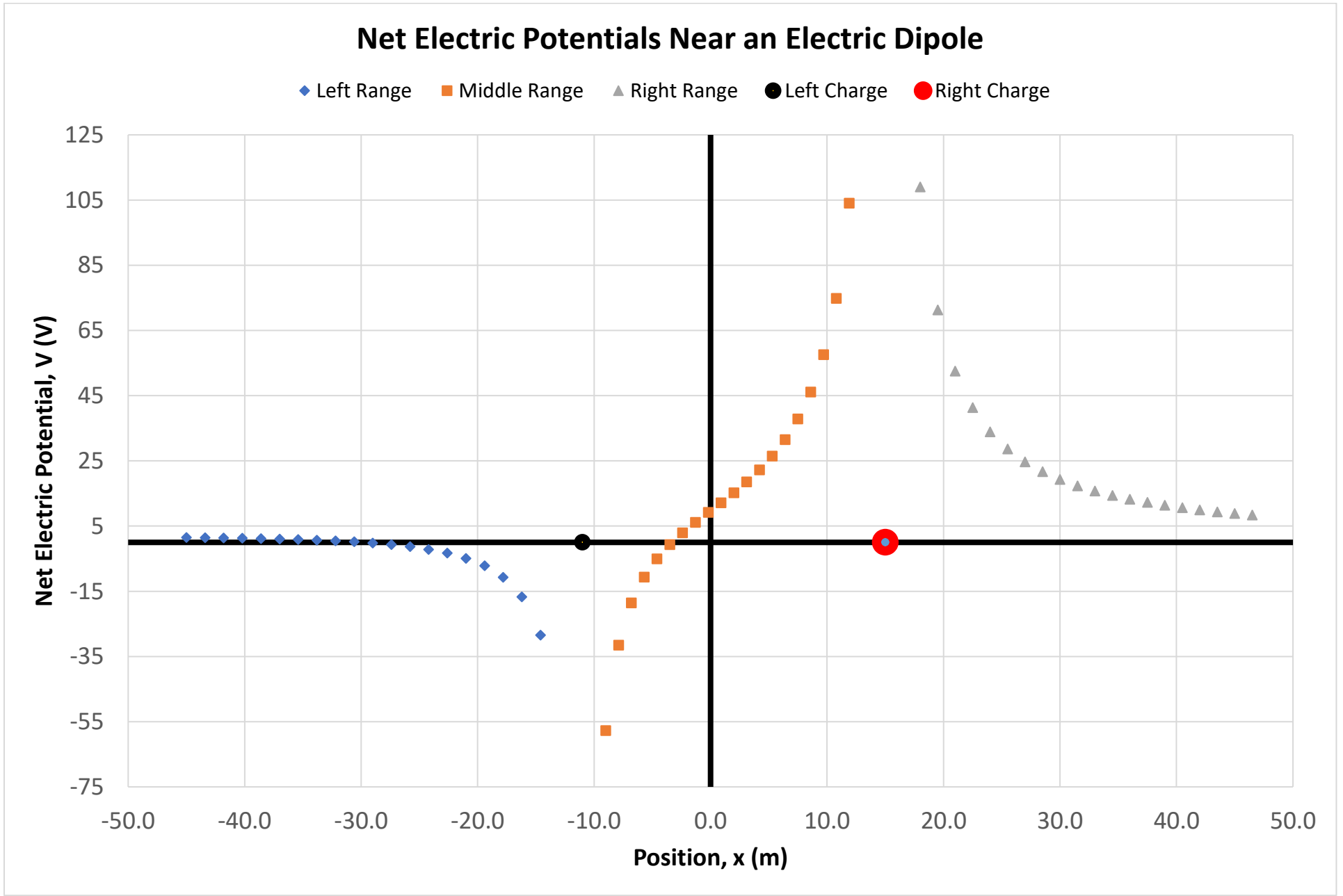
Data Point	x_L (m)	V_{TL} (V)
1	-95.00	1.39
2	-90.50	1.43
3	-86.00	1.47
4	-81.50	1.50
5	-77.00	1.54
6	-72.50	1.57
7	-68.00	1.59
8	-63.50	1.61
9	-59.00	1.62
10	-54.50	1.61
11	-50.00	1.57
12	-45.50	1.48
13	-41.00	1.31
14	-36.50	0.99
15	-32.00	0.42
16	-27.50	-0.68
17	-23.00	-3.00
18	-18.50	-8.99
19	-14.00	-36.21
20	-9.50	-82.04

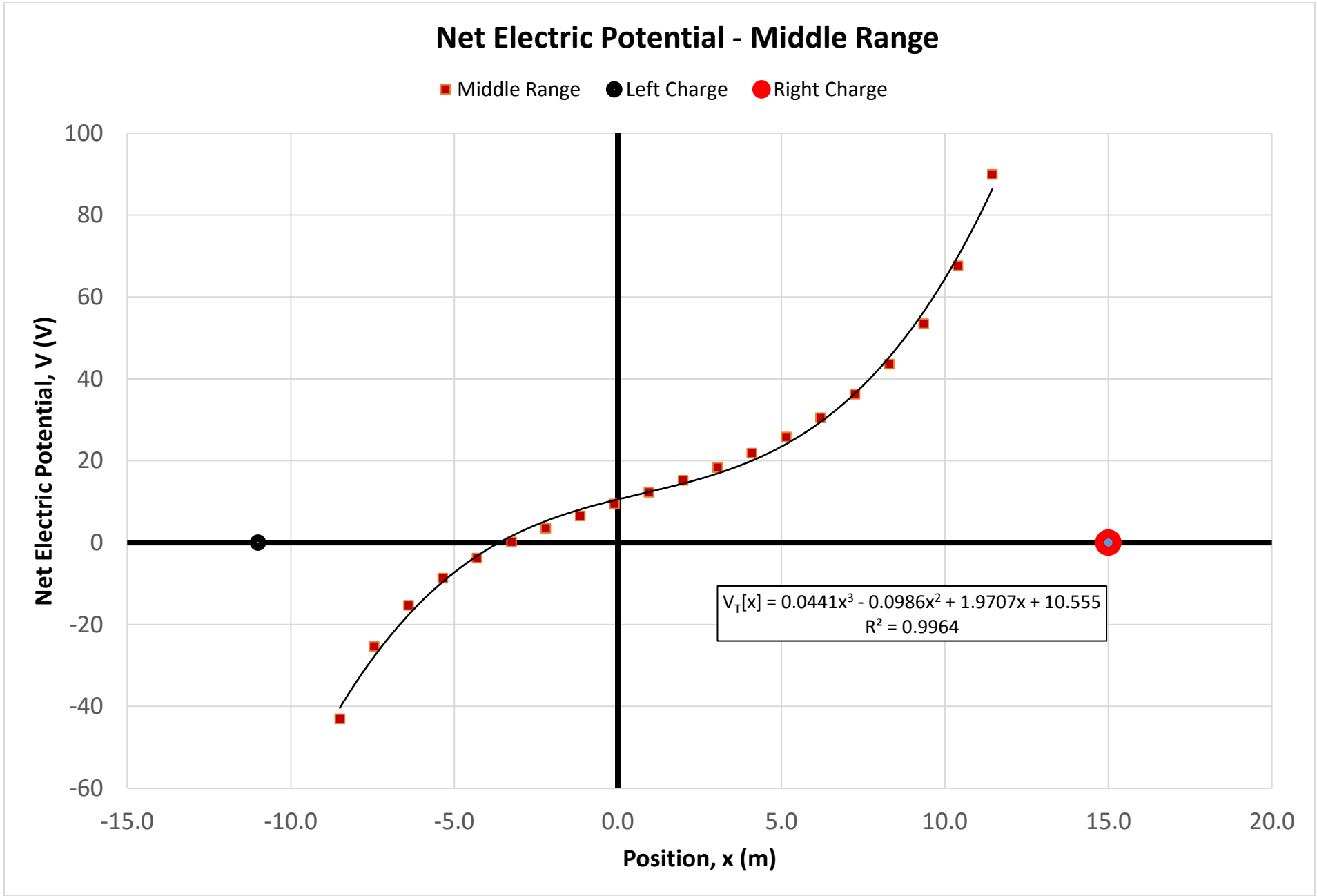
Range: Middle		
Δx_M =	1.15	(m)

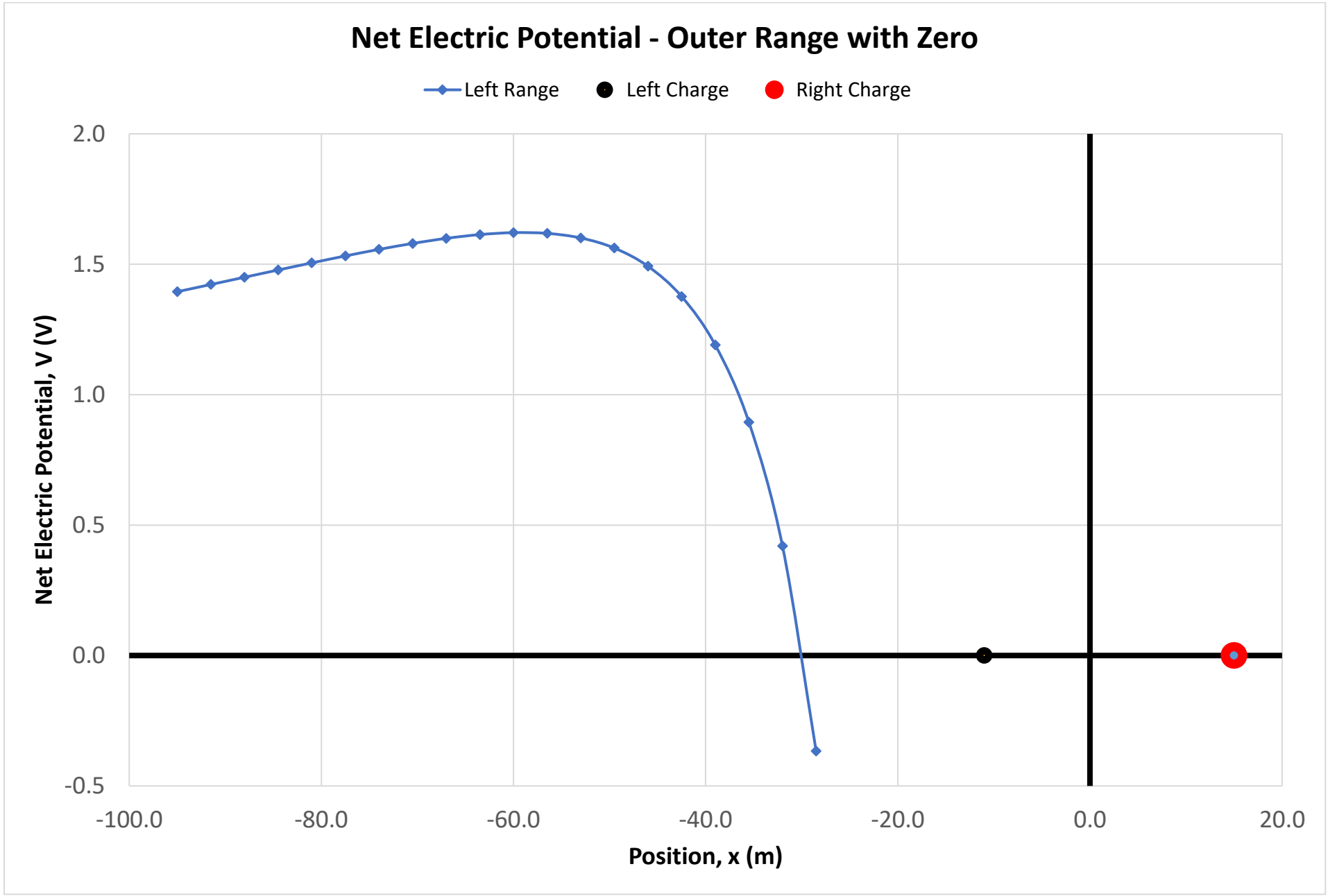
Data Point	x_M (m)	V_{TM} (V)
1	-9.00	-57.75
2	-7.85	-30.75
3	-6.70	-17.73
4	-5.55	-9.78
5	-4.40	-4.19
6	-3.25	0.16
7	-2.10	3.82
8	-0.95	7.11
9	0.20	10.25
10	1.35	13.40
11	2.50	16.69
12	3.65	20.30
13	4.80	24.42
14	5.95	29.29
15	7.10	35.34
16	8.25	43.19
17	9.40	54.01
18	10.55	70.17
19	11.70	97.29
20	12.85	153.03

Range: Right		
Δx_R =	4	(m)

Data Point	x_R (m)	V_{TR} (V)
1	17.00	165.86
2	21.00	52.50
3	25.00	30.20
4	29.00	20.83
5	33.00	15.73
6	37.00	12.55
7	41.00	10.38
8	45.00	8.83
9	49.00	7.66
10	53.00	6.75
11	57.00	6.03
12	61.00	5.43
13	65.00	4.95
14	69.00	4.53
15	73.00	4.18
16	77.00	3.88
17	81.00	3.62
18	85.00	3.39
19	89.00	3.18
20	93.00	3.00


Net Electric Potentials Near an Electric Dipole
Left Range
Middle Range
Right Range
Left Charge
Right Charge
125
105
85
65
45
25
5
-15
-35
-55
-75
Net Electric Potential, V (V)
-50.0
-40.0
-30.0
-20.0
-10.0
0.0
10.0
20.0
30.0
40.0
50.0
Position, x (m)


Net Electric Potential - Middle Range
Middle Range
Left Charge
Right Charge
Net Electric Potential, V (V)
100
80
60
40
20
0
-20
-40
-60
-15.0
-10.0
-5.0
0.0
5.0
10.0
15.0
20.0
Position, x (m)
$V_T[x] = 0.0441x^3 - 0.0986x^2 + 1.9707x + 10.555$
$R^2 = 0.9964$


Net Electric Potential - Outer Range with Zero
Left Range
Left Charge
Right Charge
2.0
1.5
1.0
0.5
0.0
-0.5
Net Electric Potential, V (V)
-100.0
-80.0
-60.0
-40.0
-20.0
0.0
20.0
Position, x (m)