

Fundamental Mathematics for Robotics
Homework Set #14-1, Dr.T

- [1] Find a linear regression equation $y = ax + b$ for the following data. You need to construct the extended table. Use three significant digits. Also, compute the RMS error.

x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.0
y	4.80	10.3	17.2	15.7	23.3	26.2	34.0	31.3	40.5	36.6

- [2] Let us use the same data set as Problem [1] but use a different model $x = cy + d$.
- (a) Find c^* and d^* .
 - (b) Find the relationship among a, b, c , and d .
 - (c) Show that the values of a^* and b^* you found in Problem [1] and the values c^* and d^* do not exactly satisfy the relationship you found in (b).
 - (d) Discuss why the computed a^*, b^*, c^* , and d^* do not satisfy the relationship exactly.

- [3] Repeat Problem [1] for the following data:

x	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.0
y	-25.9	7.94	7.36	37.9	58.2	92.7	146.	197.	254.	329.