

Holistic Numerical Methods Institute
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Multiple-Choice Test [Take this multiple-choice test on linear regression online](#)

Linear Regression Regression

1. Given $(x_1, y_1), (x_2, y_2), \dots, (x_n, y_n)$, best fitting data to $y = f(x)$ by least squares requires minimization of

(A) $\sum_{i=1}^n [y_i - f(x_i)]$

(B) $\sum_{i=1}^n |y_i - f(x_i)|$

(C) $\sum_{i=1}^n [y_i - f(x_i)]^2$

(D) $\sum_{i=1}^n [y_i - \bar{y}]^2, \bar{y} = \frac{\sum_{i=1}^n y_i}{n}$

2. The following data

x	1	20	30	40
y	1	400	800	1300

is regressed with least squares regression to $y = a_0 + a_1x$. The value of a_1 most nearly is

- A) 27.480
 B) 28.956
 C) 32.625
 D) 40.000
3. The following data

x	1	20	30	40
y	1	400	800	1300

is regressed with least squares regression to $y = a_1x$. The value of a_1 most nearly is

- A) 27.480
 B) 28.956
 C) 32.625
 D) 40.000

MULTIPLE CHOICE TEST: LINEAR REGRESSION: REGRESSION

4. An instructor gives the same y vs x data as given below to four students.

x	1	10	20	30	40
y	1	100	400	600	1200

They each come up with four different answers for the straight line regression model. Only one is correct. The correct model is

- A) $y = 60x - 1200$
B) $y = 30x - 200$
C) $y = -139.43 + 29.684x$
D) $y = 1 + 22.782x$
5. A torsion spring of a mousetrap is twisted through an angle of 180° . The torque vs angle data is given below.

T	N-m	0.110	0.189	0.230	0.250
θ	rad	0.10	0.50	1.1	1.5

The amount of strain energy stored in the mousetrap spring in Joules is

- A) 0.2987
B) 0.4174
C) 0.8420
D) 1562
6. A scientist finds that regressing the y vs x data given below to straight-line $y = a_0 + a_1x$ results in the coefficient of determination for the straight-line model, r^2 to be zero.

x	1	3	11	17
y	2	6	22	?

The missing value for y at $x = 17$ most nearly is

- A) -2.444
B) 2.000
C) 6.889
D) 34.00

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