Question (1) a $\quad h = \theta^T(x) + \theta_0$

$$h(x) = \theta_1(x) + \theta_0.$$

to find θ_0 & θ_1

$$\arg\min_\theta \sum_{i=1}^{m} (y^{(i)} - (\theta_0 + \theta_1 x^{(i)}))^2$$

Taking partial derivates.

$$\theta_0 = \sum_{i=1}^{m} \frac{y^{(i)} - \theta_1 x^{(i)}}{m} \quad \text{— (a)}$$

$$\theta_1 = \frac{\sum_{i=1}^{m} x^{(i)}(y^{(i)} - \theta_0)}{\sum_{i=1}^{m} (x^{(i)})^2} \quad \text{— (b)}$$

i	x	y
1	-2	2
2	2	4
3	3	8
4	5	11
5	4	17

$m = 5$

$$\theta_0 = \frac{(2+2\theta_1 + 4-2\theta_1 + 8-3\theta_1 + 11-5\theta_1 + 17-4\theta_1)}{5}$$

$$\theta_0 = (42 - 12\theta_1)/5$$

$$5\theta_0 + 12\theta_1 = 42 \quad \text{— (1)}$$

Putting (x^i, y^i) in (b)

$$\theta_1 = \frac{-2\times(2-\theta_0) + 2(4-\theta_0) + 3(8-\theta_0) + 5(11-\theta_0) + 4(17-\theta_0)}{4+4+9+25+16}$$

$12\theta_0 + 58\theta_1 = 151 \quad \leftarrow (2)$

$5\theta_0 + 12\theta_1 = 42. \quad \leftarrow (1)$

$(1) \times 12/5.$

$\Rightarrow$

$12\theta_0 + \frac{144}{5}\theta_1 = 100.8 \quad \rightarrow (3)$

$12\theta_0 + 58\theta_1 = 151.$

$-29.2\theta_1 = -50.2$

$\underline{\underline{\theta_1 = 1.72}}$

$\cancel{\underline{\theta_0 = 51.29}}$

$\cancel{y = 51.29 + 1.72x}$

$\theta_0 = \frac{151 - 58 \times 1.72}{12}$

$= \underline{\underline{4.27}}$

3.6825

6.41×16.157.