$$y = 4x$$

$$\begin{aligned} Cov(x,y) &= E(xy) - E(x)E(y) \\ &= E(4x^2) - E(x)\,E(4x) \\ &= E(4x^2) - 4\,E(x^2) \\ &= 4\,[Var(x)] \\ &= 4 \times 1 \\ &= 4. \end{aligned}$$

$$\rho = \frac{Cov(x,y)}{\sigma_x\,\sigma_y} = \frac{4}{1 \times \sqrt{17}} = 4/\sqrt{17}.$$

Bivariate Normal Conditional distribution takes the following form

$$X|Y = N\left(\mu_x + \frac{\sigma_x}{\sigma_y}(y-\mu_y)\rho,\ (1-\rho^2)\sigma_x^2\right)$$

$\mu_x = 0$, $\sigma_x = 1$

$\mu_y = 0$ $\sigma_y = \sqrt{17}$ → From 4.2.b

Setting $Y = 2$

$$\mu_{x|y} = 0 + \frac{1}{\sqrt{17}} * \frac{4}{\sqrt{17}} * (2-0)$$

$$\mu_{x|y} = \frac{8}{17}.$$

$$\sigma^2_{x|y} = \left(1 - \left(\frac{4}{\sqrt{17}}\right)^2\right) * 1$$

$$= \left(1 - \frac{16}{17}\right)$$

$$= 1/17.$$