$$\Rightarrow E[\ln P(Y|\mu)] = E[\ln \underbrace{P(y_1, y_2, y_3|\mu)}_{\underbrace{\prod_{i=1}^{3} P(y_i|\mu)}_{\sum_{i=1}^{3} \ln P(y_i|\mu)}}] = \sum_{i=1}^{3} E[\ln P(y_i|\mu)] =$$

$$= \sum_{i=1}^{3} E\left[-\frac{3}{2}\ln 2 - \frac{1}{2}\ln \pi - \sum_{j=1}^{2} z_{ij} \frac{(x_i-\mu)^2}{2\sigma_j^2}\right] =$$

$$= \sum_{i=1}^{3} \left(-\frac{3}{2}\ln 2 - \frac{1}{2}\ln \pi - \frac{1}{2}\sum_{j=1}^{2} \underbrace{E[z_{ij}]}_{p_{ij}} \frac{(x_i-\mu)^2}{\sigma_j^2}\right)$$

$$= 3\left(-\frac{3}{2}\ln 2 - \frac{1}{2}\ln \pi\right) - \frac{1}{2}\sum_{i=1}^{3}\sum_{j=1}^{2} p_{ij} \frac{(x_i-\mu)^2}{\sigma_j^2} \overset{\text{not}}{=} Q(\mu \mid \mu^{(t)})$$

$$\mu^{(t+1)} = \underset{\mu}{\operatorname{argmax}}\, Q(\mu) = \underset{\mu}{\operatorname{argmin}} \sum_{i=1}^{3}\sum_{j=1}^{2} p_{ij} \frac{(x_i-\mu)^2}{\sigma_j^2} =$$

$$= \underset{\mu}{\operatorname{argmin}} \left(\sum_{i=1}^{3} p_{i1} \frac{(x_i-\mu)^2}{1} + (1-p_{i1}) \frac{(x_i-\mu)^2}{2^2}\right)$$

$$= \underset{\mu}{\operatorname{argmin}} \Big(\mu^2 \Big(\sum_{i=1}^{3} [p_{i1} + \frac{1}{2^2}(1-p_{i1})]\Big) -$$

$$-2\mu\Big(\sum_{i=1}^{3} p_{i1}x_i + (1-p_{i1})x_i \frac{1}{2^2}\Big) +$$

$$+ \dots \Big)$$

$$= \frac{\sum_{i=1}^{3}\left(p_{i1}x_i + (1-p_{i1})x_i \cdot \frac{1}{4}\right)}{\sum_{i=1}^{3}\left(p_{i1} + \frac{1}{4}(1-p_{i1})\right)} = \frac{\sum_{i=1}^{3} \frac{3}{4} p_{i1}x_i + \frac{1}{4}\sum_{i=1}^{3} x_i}{\left(\sum_{i=1}^{3} \frac{3}{4} p_{i1}\right) + \frac{3}{4}} = \frac{3\sum_{i=1}^{3} p_{i1}x_i + \sum_{i=1}^{3} x_i}{3 + 3\sum_{i=1}^{3} p_{i1}} =$$

$$= \frac{\sum_{i=1}^{3} p_{i1}x_i + \frac{1}{3}\sum_{i=1}^{3} x_i}{1 + \sum_{i=1}^{3} p_{i1}} = \frac{\frac{1}{3}\cdot 4 + \frac{33}{52}\cdot 4{,}6 + \frac{5}{17}\cdot 2 + \frac{10{,}6}{3}}{1 + \frac{1}{3} + \frac{33}{52} + \frac{5}{17}} \cong 3{,}702$$