3.

a) Prior probabilities,

$$p(\omega_1) = \frac{6}{12} = 0.5 \qquad p(\omega_2) = \frac{6}{12} = 0.5$$

b) For class ω_1,

$$\mu_1 = \frac{\sum_{i=1}^{6} \omega_{1i}}{6} = [2, 1.33]$$

co-variance matrix $= [[30, 19], [19, 18]] = \Sigma_1$

For class ω_2,

$$\mu_2 = [9, 10]$$

$$\Sigma_2 = [[420, 459], [459, 536]]$$

c)