Solution 1: (a) \( \ln L(\Theta; x_i) = (\Sigma x_i) \ln \Theta + (n-\Sigma x_i) \ln (1-\Theta); \)
\[
\frac{d}{d\Theta} \ln L(\Theta; x_i) = (\Sigma x_i) / \Theta - ((n-\Sigma x_i) / (1-\Theta)) = 0
\]
therefore \( \Theta_{ML} = (\Sigma x_i) / n \)
(b) \( \mathbb{E}[\Theta_{ML} | \Theta] = \Theta \)---the estimate is unbiased.

Solution 2: \( p(Y_4; \Theta) = \int \int 4! / \Theta^4 dy_1 dy_2 dy_3 = 4 Y_4^3 / \Theta^4 \)
\( p(Y_1, Y_2, Y_3; Y_4; \Theta) = 3! / Y_4^3 \) and independent of \( \Theta \).
\( Y_4 \) is a sufficient statistic.