1. Casella and Berger, 4.36.

2. If $X \sim N_n(0, \Sigma)$, then for any symmetric and nonnegative matrix $A$, $X'AX \sim \chi^2_r \iff \Sigma A \Sigma A \Sigma = \Sigma A \Sigma$ and $r = \text{trace}(A \Sigma)$.

3. Let $X_1$ and $X_2$ be independent Bernoulli random variables with success probabilities $p$ and $p/2$, respectively, with $0 < p < 1$. Is $X_1 + X_2$ sufficient in this setting? Justify your answer.

4. Casella and Berger, 6.2.

5. Casella and Berger, 6.5.

6. Casella and Berger, 6.6.