

Solution for review exercise 35 (chapter 2) in Pitman

Question a)

$$\sum_{i=20}^{35} \binom{1000}{i} \left(\frac{1}{38}\right)^i \left(\frac{37}{38}\right)^{1000-i}$$

Question b) The standard deviation $\sqrt{1000 \frac{1}{38} \frac{37}{38}} \approx 5.1$ is acceptable for the Normal approximation.

$$\Phi\left(\frac{35 + \frac{1}{2} - 1000 \frac{1}{38}}{\sqrt{1000 \frac{1}{38} \frac{37}{38}}}\right) - \Phi\left(\frac{20 - \frac{1}{2} - \frac{1000}{38}}{\sqrt{1000 \frac{1}{38} \frac{37}{38}}}\right) = \Phi(1.814) - \Phi(-1.346) = 0.8764$$