3F Approximating from the Binomial Distribution

1. A biased coin has $P(Head) = 0.53$. The coin is tossed 100 times and the number of heads, X, is recorded.

a) Write down a binomial model for X

b) Explain why X can be approximated using a normal distribution

c) Find the values of μ and σ in this approximation

2. The binomial random variable $X \sim B(150, 0.48)$ is approximated by the normal random variable $Y \sim N(72, 6.12^2)$.

a) Use this approximation to find $P(X \leq 70)$

b) Also use the approximation to find $P(80 \leq X < 90)$

3. For a particular type of flower bulb, 55% will produce yellow flowers. A random sample of 80 bulbs is planted.

   Calculate the percentage error incurred when using a normal approximation to estimate the probability that there are <u>exactly</u> 50 yellow flowers.