

Name _____

Student Number _____

STA256H5F Quiz 7

In the last Ontario election about 1.8 million people voted Liberal, 1.5 million voted Conservative, and 1.1 million voted for the NDP. Let X be number of people voting Liberal in an election (in millions). Also Suppose $X \sim N(1.8, 0.2417)$.

1. (3 marks) What is the probability that the Liberals get 2.2 Million votes or more in the next election?
 $P(X > 2.2 - 1.8) / 0.2417 = P(X > 1.655)$

2. (3 marks) Suppose we sampled 10 voters at random from the population. What is the probability more than half of them voted liberal. Note: you should not use the normal distribution for this question.

$$P(Y > 5) \text{ with } Y \text{ binomial}(n=10, p=1.8/(1.5+1.1+1.8))$$

3. (4 marks) Suppose we came up with another random variable Y which is the proportion of the entire voting population that voted liberal in the last election. Let Y be Normal with $E(Y) = P$ and $V(Y) = P(1-P)/4.4$ (where P is the proportion of people who voted liberal). Find $P(Y > 0.5)$.

$$P(X > 0.5 - 0.41 / (0.2417 / 4.4)) = \text{same as 1}$$

Good Luck!