Section 1: Introducing the binomial distribution

Crucial points

1. **Read questions very carefully**
   Be careful with the wording in the question: many students make careless errors misinterpreting the question. Make sure that you recognise the difference between "more than" and "at least": e.g. "more than 10" means "at least 11" – think about it!

2. **Use the correct notation and define your variables**
   The correct notation is important to help you explain your answers.
   - Define your variable X clearly at the start of the question.
   - Write down values of n and p clearly.
   - Show what you are trying to calculate: this is much better than a list of fractions and decimals that appears to anybody else randomly ordered!
     e.g. $P(X > 1) = 1 - (P(X = 0) + P(X = 1))$

3. **Remember to use the binomial coefficient**
   Make sure you include the binomial coefficient ${}_nC_r$ in your method.

4. **Take care when finding the probability for a range of values**
   Be careful with inequalities – write out your working carefully.
   e.g. $P(X \geq 4) = 1 - P(X \leq 3) = 1 - 0.6477 = 0.3523$

5. **Check the conditions before using the binomial distribution**
   Obviously not all probability questions can be solved using the binomial distribution. If you are in doubt about whether you should be using the binomial distribution check the conditions:
   - random samples of a fixed size, n
   - the probability of success, denoted by p, is constant (hence $q = 1 - p$ is also constant.
   - the trials are independent

6. **Take care with accuracy when using decimals**
   If using decimals, work to at least 3 significant figures. If possible use exact numbers until the end of the calculation.