Section 6.1

4 A particular brand of shirts comes in 12 colours, has a male version and a female version, and comes in three sizes for each sex. How many different types of this shirt are made. (1 pt)

56 The name of a variable in the C programming language is a string that contains uppercase letters, lowercase letters, digits, or underscores. Further, the first character in the string must be a letter, either uppercase or lowercase, or an underscore. If the name of a variable is determined by its first eight characters, how many different variables can be named in C? (Note that the name of a variable may contain fewer than eight characters.) (1 pt)

Section 6.2

4 A bowl contains 10 red and 10 blue balls. A woman selects balls at random without locking at them. (2 pt)
   a) How many balls must she select to be sure of having at least three balls of the same color?
   b) How many balls must she select to be sure of having at least three blue balls?

26 Show that in a group of five people (where any two people are either friends or enemies), there are not necessarily three mutual friends or three mutual enemies. (1 pt)

34 Assuming that no one has more than 1,000,000 hairs on the head of any person and that the population of New York City was 8,008,278 in 2010, show there had to be at least nine people in New York City in 2010 with the same number of hairs on their heads. (1 pt)

Section 6.3

18 A coin is flipped eight times where each flip comes up either heads or tails. How many possible outcomes (4 pt)
   a) are there in total?
   b) contain exactly 3 heads?
   c) contain at least 3 heads?
   d) contain the same number of heads and tails?

22 How many Permutations of the letters ABCDEFGH contain (6 pt)
   a) the string ED?
   b) the string CDE?
   c) the strings BA and FGH?
   d) the string AB, DE, and GH?
   e) the string CAB and BED?
   f) the string BCA and ABF?
Section 6.4

8 What is the coefficient of $x^8y^9$ in the expansion of $(3x + 2y)^{17}$? (1 pt)

12 The row of Pascal’s triangle containing the binomial coefficients $\binom{10}{k}$, $0 \leq k \leq 10$, is:

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</thead>
<tbody>
<tr>
<td>1</td>
<td>10</td>
<td>45</td>
<td>120</td>
<td>210</td>
<td>252</td>
<td>210</td>
<td>120</td>
<td>45</td>
<td>10</td>
<td>1</td>
</tr>
</tbody>
</table>

Use Pascal’s identity to produce the row immediately following this row in Pascal’s triangle. (1 pt)