HW #3, due September 21\textsuperscript{st}

Chapter 5: 5, 8, 12, 27, 28, 29, 30, 41
Chapter 6: 2, 5, 7

Extra Problems for HW #3

**Problem 1:** Give a combinatorial proof that
\[ k\binom{n}{k} = n\binom{n-1}{k-1}. \]

**Problem 2:** The six cells of the brick below are to be colored with 2 red cells, 2 blue cells, and 2 green cells. How many colorings are possible if no consecutive cells may be colored the same color?

\[
\begin{array}{cccccc}
\text{ } & \text{ } & \text{ } & \text{ } & \text{ } & \\
\text{ } & \text{ } & \text{ } & \text{ } & \text{ } & \\
\text{ } & \text{ } & \text{ } & \text{ } & \text{ } & \\
\end{array}
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