SHOW ALL WORK AND JUSTIFY ALL ANSWERS.

1. (3 points) Experiment: Roll a pair of fair 6-sided dice. Observe the numbers on top of each die.

   (a) Determine the **event** E where the sum of the number is less than five.

   (b) Give the probability that one die is a 5 or the sum is 8.

2. (2 points) A child counted the number of each color of skittles in a bag of Skittles candy. The results are in the table. Find the probability distribution for the data.

Color	Red	Yellow	Green	Purple	Orange
Frequency of Occurrence	11	9	12	7	14

3. (2 points) Let E and F be two events of an experiment with sample space S. Suppose $P(E) = 0.32, P(F) = 0.21$, and $P(E \cap F) = 0.13$. Compute $P(E \cup F)$.

4. (2 points) A traffic light is green for 40 seconds, red for 45 seconds, and yellow for 15 seconds. What is the probability of approaching the light when it is green?

5. (1 point) What does it mean if events E and F are mutually exclusive?