The payoffs in the casino game Chuck-a-Luck are determined by the number of threes that appear when a set of four-sided dice (a four-sided die has the numbers 1, 2, 3, and 4 on its faces) are tossed.
a. If 20 dice are tossed, what is the probability that at most 4 threes will appear?
b. If 12000 dice are tossed, what is the probability that at most 2990 threes will appear?

