### 1. Probability that Sam’s first upgrade will occur after the third flight

To find the probability that Sam's first upgrade occurs after the third flight, we need to consider the complementary event: Sam does not get upgraded on his first three flights. Since the probability of not being upgraded on any single flight is \(1 - 0.10 = 0.90\), and the events are independent, we calculate:

\[ P(\text{no upgrade on first 3 flights}) = 0.90^3 \]

\[ P(\text{no upgrade on first 3 flights}) = 0.90 \times 0.90 \times 0.90 = 0.729 \]

Thus, the probability that Sam's first upgrade occurs after the third flight is:

\[ \boxed{0.729} \]

### 2. Probability that Sam will be upgraded exactly 2 times in his next 20 flights

This scenario follows a binomial distribution where \( n = 20 \), \( p = 0.10 \), and we are looking for exactly \( k = 2 \) successes (upgrades). The binomial probability formula is:

\[ P(X = k) = \binom{n}{k} p^k (1-p)^{n-k} \]

Substituting the values:

\[ P(X = 2) = \binom{20}{2} (0.10)^2 (0.90)^{18} \]

First, we calculate the binomial coefficient:

\[ \binom{20}{2} = \frac{20!}{2!(20-2)!} = \frac{20 \times 19}{2 \times 1} = 190 \]

Now, substituting back:

\[ P(X = 2) = 190 \times (0.10)^2 \times (0.90)^{18} \]

\[ P(X = 2) = 190 \times 0.01 \times (0.90)^{18} \]

We need to compute \( (0.90)^{18} \):

\[ (0.90)^{18} \approx 0.1481 \]

So,

\[ P(X = 2) = 190 \times 0.01 \times 0.1481 = 0.28139 \]

Thus, the probability that Sam will be upgraded exactly 2 times in his next 20 flights is:

\[ \boxed{0.28139} \]

### 3. Would you be surprised if Sam receives more than 20 upgrades to first class during the year?

For 104 flights, we use the normal approximation to the binomial distribution since \( n = 104 \) and \( p = 0.10 \) are sufficiently large. The mean (\(\mu\)) and standard deviation (\(\sigma\)) of a binomial distribution are given by:

\[ \mu = np = 104 \times 0.10 = 10.4 \]

\[ \sigma = \sqrt{np(1-p)} = \sqrt{104 \times 0.10 \times 0.90} = \sqrt{9.36} \approx 3.06 \]

We want to find \( P(X > 20) \). Using the normal approximation, we convert to a z-score:

\[ z = \frac{X - \mu}{\sigma} = \frac{20 - 10.4}{3.06} \approx \frac{9.6}{3.06} \approx 3.14 \]

Looking up the z-score of 3.14 in the standard normal distribution table, we find that the probability of a z-score being greater than 3.14 is very small, approximately 0.00085.

Since the probability of Sam receiving more than 20 upgrades is extremely low (less than 0.1%), we would indeed be surprised if this happened. Therefore, the answer is:

\[ \boxed{\text{Yes, I would be surprised because the probability of Sam receiving more than 20 upgrades is extremely low, approximately 0.00085.}} \]