Binomial Probability Problems 2

Name:

Solve each of the probability problems below.

1) Another scoundrel alters a coin so that it is a <u>biased</u> coin; each time it's tossed, there's a $\frac{5}{4}$ chance of getting a head.

- a) Find the probability of tossing exactly 4 tails in 6 tosses.
- b) Find the probability of tossing at least 4 tails in 6 tosses.
- c) Find the probability of tossing at most 2 tails in 6 tosses

2) You find the empirical probability of winning a game by observing that in the last 100 games played, you've won 76 of them. Based on this, answer the questions below. (Leave answers in expanded form.)

a) Find the probability of winning at most 1 game if you play 5 games in all.

b) Find the probability of winning at least 3 games if you play 5 games in all.

c) Find the probability of losing all games if you play 5 games in all.

3) Mr. Haas was distracted one morning and ended up putting his hard-boiled eggs in a bowl with some raw eggs. He knows that 5 of the eggs are hard-boiled and 7 of the eggs are raw. Mr. Haas also knows that if you spin an egg, you can tell if it's raw or hard-boiled. So he decides to pick up an egg, spin it, and put it back in the bowl. He's still a little sleepy, so he forgets to keep track of which eggs he's already spun. Given this, answer the questions below. (All answers may be left in expanded form.)

a) If Mr. Haas spins 4 eggs (chosen randomly and replaced), what's the probability that <u>exactly 3</u> are <u>hard-boiled</u>?

b) If Mr. Haas spins 7 eggs (chosen randomly and replaced), what's the probability that <u>at most 2</u> are <u>raw</u>?

4) Assume that the figure shown is a dartboard. The dimensions of the large rectangle are 20 by 30 inches and the dimensions of the inner rectangle are 10 by 15 inches. (Assume that all the darts land somewhere on the dartboard and that the skill of the dart thrower doesn't affect the outcome.) Show all work and find the probability for each question below.



- a) If I throw **five** darts at the dartboard, what's the probability that **exactly 3** of the darts will land in the smaller rectangle?
- b) If I throw **ten** darts at the dartboard what's the probability that **at most three** of the darts will land in the smaller rectangle? (Leave in expanded form.)
- c) If I throw **eight** darts at the dartboard, what's the probability that **at least six** of the darts will land in the smaller rectangle? (Leave in expanded form.)