6.3 Probability in games of chance

Question 1 _____ / 3

What is the probability of getting exactly 3 heads on 10 tosses of a fair coin?

n, the amount of trial repeats: 10

k, the amount of successes (heads): 3

p, the probability of success: $(1/2)$

Use the formula of $C(n,k) \cdot p^k \cdot (1-p)^{n-k}$ to find the probability.
$C(10,3) \cdot (1/2)^3 \cdot (1/2)^7 = \frac{15}{128}$

Question 2 _____ / 3

What is the probability that in seven rolls of a six-sided die, the result of 1 appears *at least* five times?

		repeats n	successes k	probability p
A	Getting five 1's	7	5	1/6
B	Getting six 1's	7	6	1/6
C	Getting seven 1's	7	7	1/6

Now, using the formula $C(n,k) \cdot p^k \cdot (1-p)^{n-k}$ three different times for case (A), (B), and (C).

(A) $C(n,k) \cdot p^k \cdot (1-p)^{n-k} = C(7,5) \cdot (1/6)^5 \cdot (5/6)^2$

(B) $C(n,k) \cdot p^k \cdot (1-p)^{n-k} = C(7,6) \cdot (1/6)^6 \cdot (5/6)^1$

(C) $C(n,k) \cdot p^k \cdot (1-p)^{n-k} = C(7,7) \cdot (1/6)^7 \cdot (5/6)^0$

To find the probability of getting at least five 1's in seven rolls, add (A), (B), and (C) together. (Just write out the formula; don't solve.)

Prob(at least five 1's) = $C(7,5) \cdot (1/6)^5 \cdot (5/6)^2 + C(7,6) \cdot (1/6)^6 \cdot (5/6)^1 + C(7,7) \cdot (1/6)^7 \cdot (5/6)^0$

Question 3 ____ / 3

What is the probability of getting exactly one 6 on 10 tosses of a fair six-sided die?

$n = 10$, $k = 1$, $p = (1/6)$

$C(10,1) \cdot (1/6)^1 \cdot (5/6)^9 \approx 0.323$