MTH 451 Quiz 3

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Question 1.

(a) let $a = 1$ and $b = 1$. Then

$$(a+b)^n = (1+1)^n = \sum_{k=0}^{n} \binom{n}{k}$$

(b) Let $a = -1$ and let $b = 1$. Then

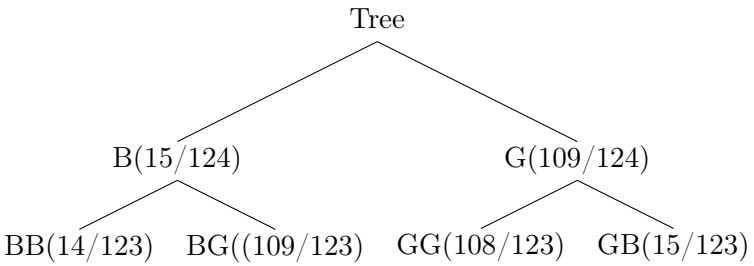
$$(-1+1)^n = \sum_{k=0}^{n} \binom{n}{k}(-1)^k$$

(c) Let $x = a - 1$ and $y = 1$. Then

$$(x+y)^n = (a)^n = (a-1+1)^n = \sum_{k=0}^{n}(a-1)^k$$

Question 2.

(a) Let B denote the event of getting a broken item and let G denote the event of getting a non-broken item.



(b) Since $B = \frac{15}{124}$ and $BB = \frac{14}{123}$, $P(B \cap BB) = B \times BB = .014$

(c) We have $P(BB) = \frac{|BB|}{|S|} = \frac{\binom{15}{2}}{\binom{124}{2}} = 0.014$. We get the same answer as expected.