

**What's the probability that you get out of bed before 8am tomorrow?**

**What's the probability that you eat breakfast before 9am tomorrow?**

**Does the first answer affect the second?**

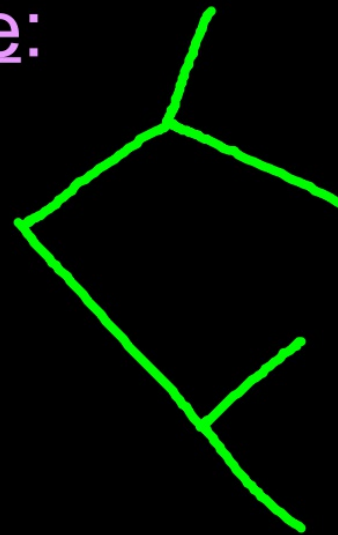
## Today's learning objective:

By the end of class, I will be able to construct probability trees in order to help me solve interesting problems.

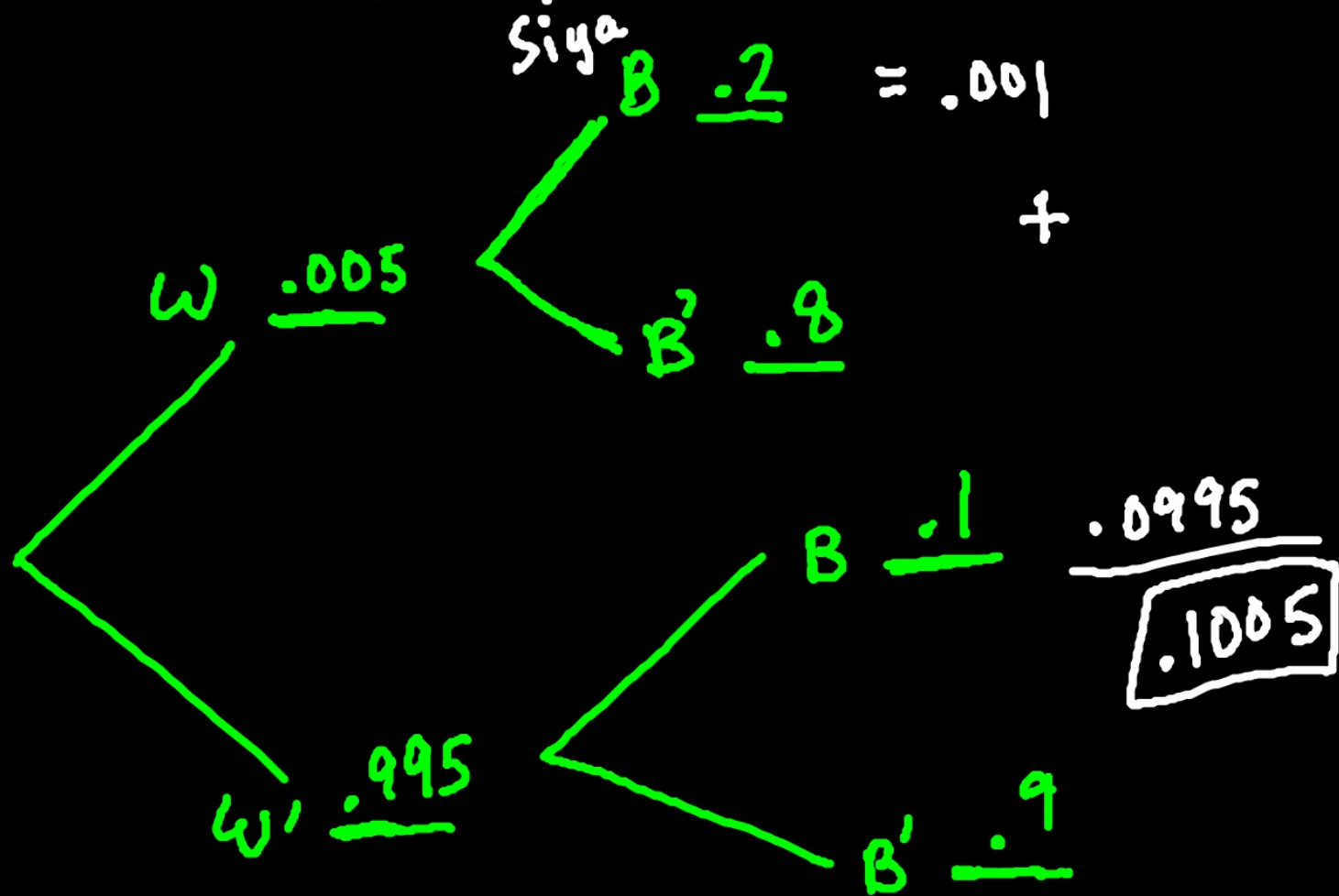
## Today's language objective:

Probability tree  
Independent events  
Conditional events  
Complementary events

\*I will utilize this terminology while speaking in small groups.



What's the probability that you eat breakfast tomorrow?

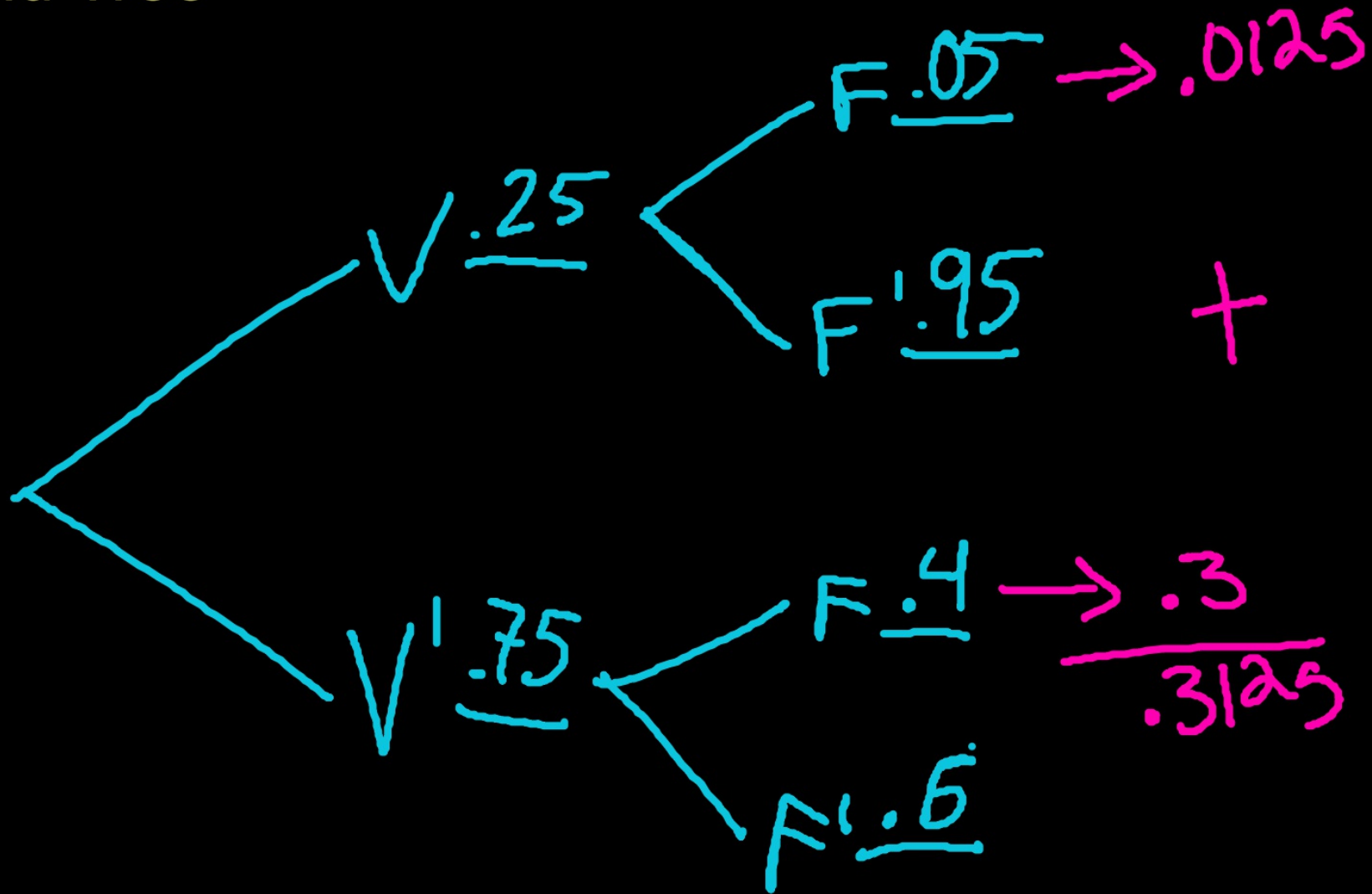


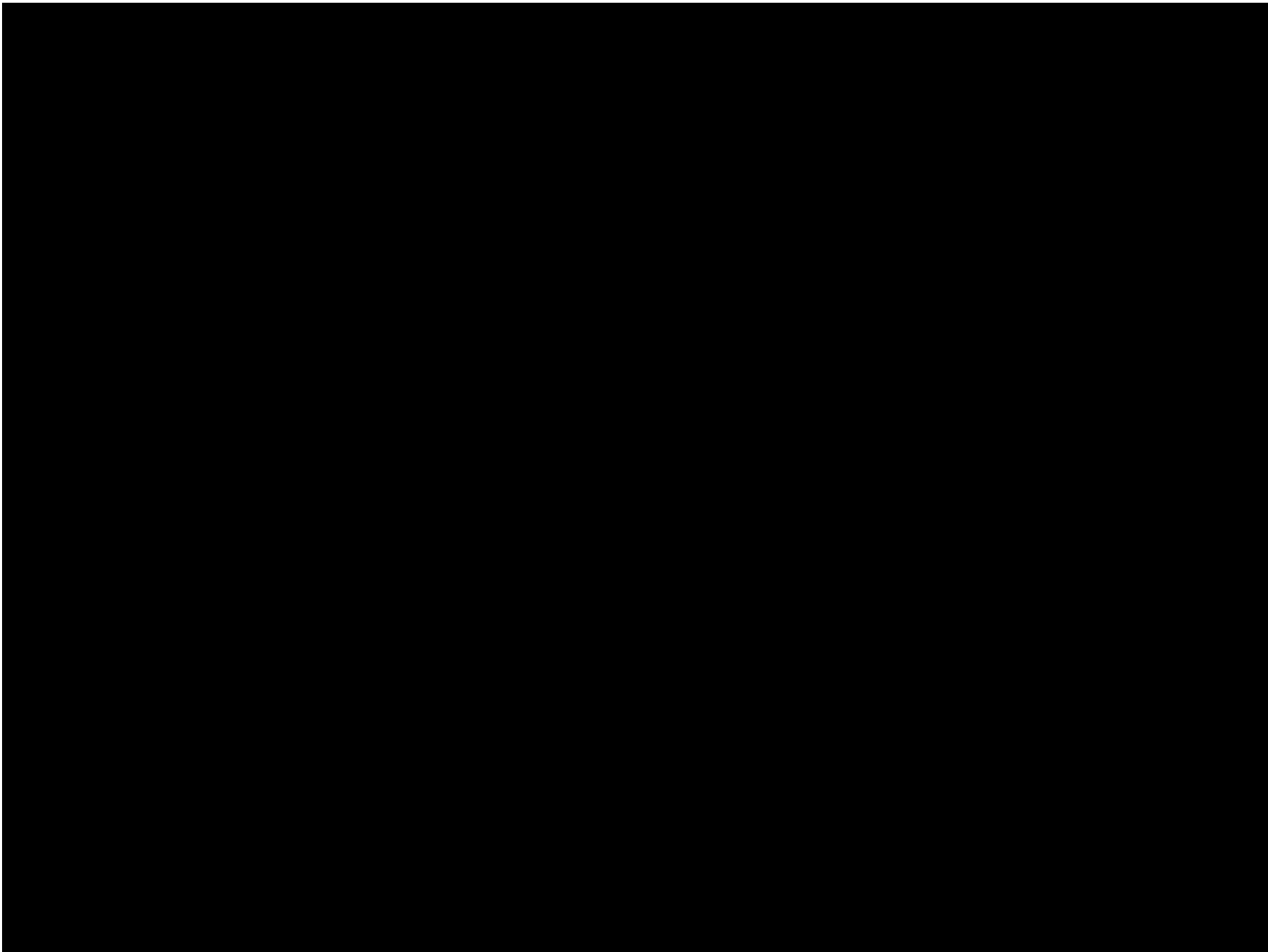
**The probability of contracting the flu if you've been vaccinated is 5%. The probability of contracting the flu if you haven't been vaccinated is 40%.**

**1/4 of the population gets a flu shot.**

**If a person is chosen from random from the population, what is the probability the person getting the flu?**

# Flu Tree



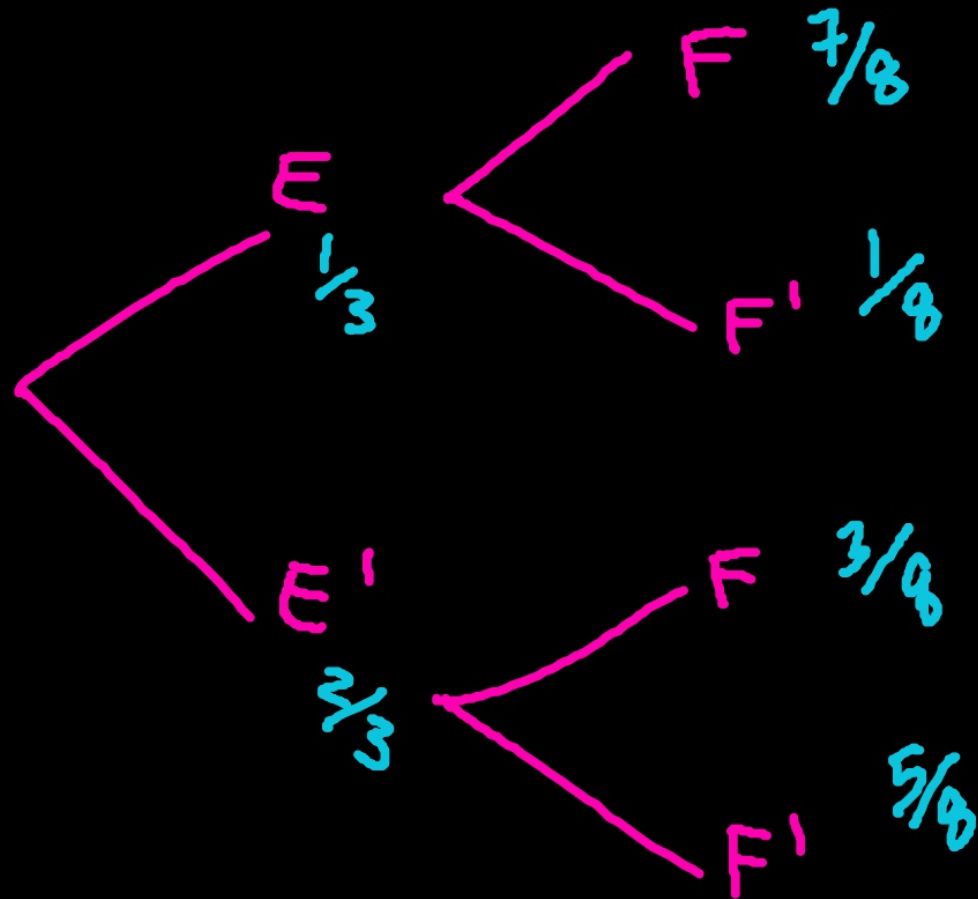


10.) José travels to school on a bus. On any day, the probability that José will miss the bus is  $\frac{1}{3}$ .

If he misses his bus, the probability that he will be late for school is  $\frac{7}{8}$ .

If he does not miss his bus, the probability that he will be late is  $\frac{3}{8}$ .

Let  $E$  be the event “he misses his bus” and  $F$  the event “he is late for school”.  
The information above is shown on the following tree diagram.



(a) Find

(i)  $P(E \cap F)$ ;  $\frac{1}{3} \cdot \frac{7}{8} = \frac{7}{24}$

(ii)  $P(F)$ .  $\frac{2}{3} \cdot \frac{3}{8} = \frac{6}{24} + \frac{7}{24} = \frac{13}{24}$

(b) Find the probability that

(i) José misses his bus and is not late for school;  $\frac{1}{3} \cdot \frac{1}{8} = \frac{1}{24}$

(ii) José missed his bus, given that he is late for school.

$$\frac{\frac{7}{24}}{\frac{13}{24}} = \frac{7}{13}$$

our denominator  
has changed



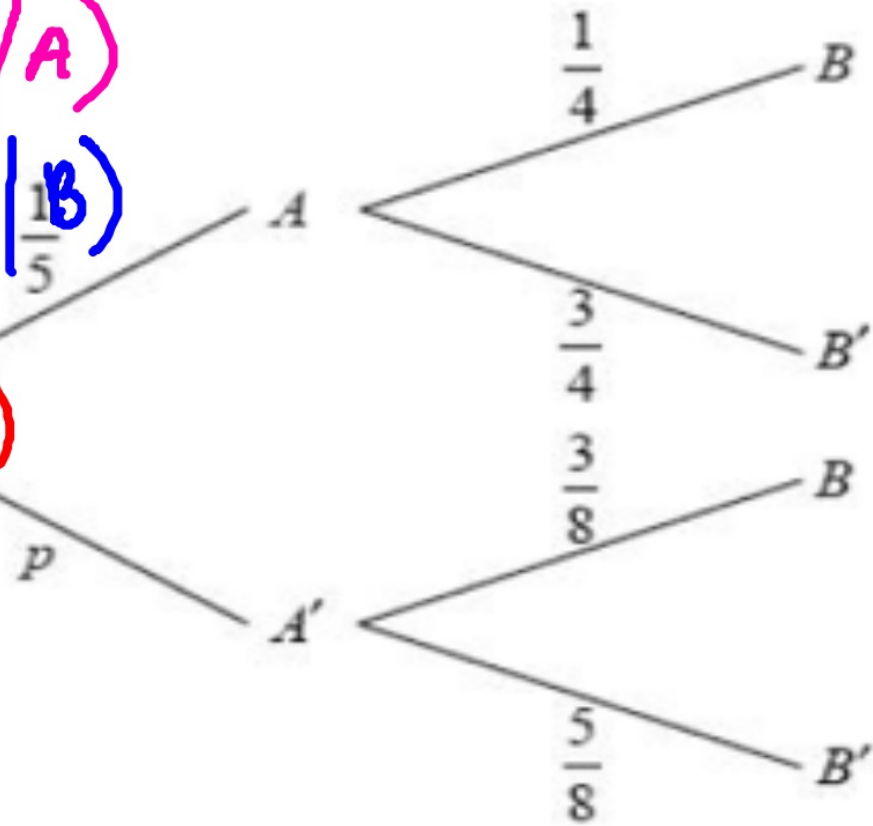
14.) The diagram below shows the probabilities for events  $A$  and  $B$ , with  $P(A') =$

$$P(A \cap B) = P(A) P(B|A)$$

$$P(B \cap A') = P(B) P(A'|B)$$

$$\frac{6/20}{7/20} = \frac{7}{20} \cdot P(A'|B)$$

$$\frac{6}{7} = P(A'|B)$$



(a) Write down the value of  $p$ .

$4/5$

(b) Find  $P(B)$ .

$7/20$

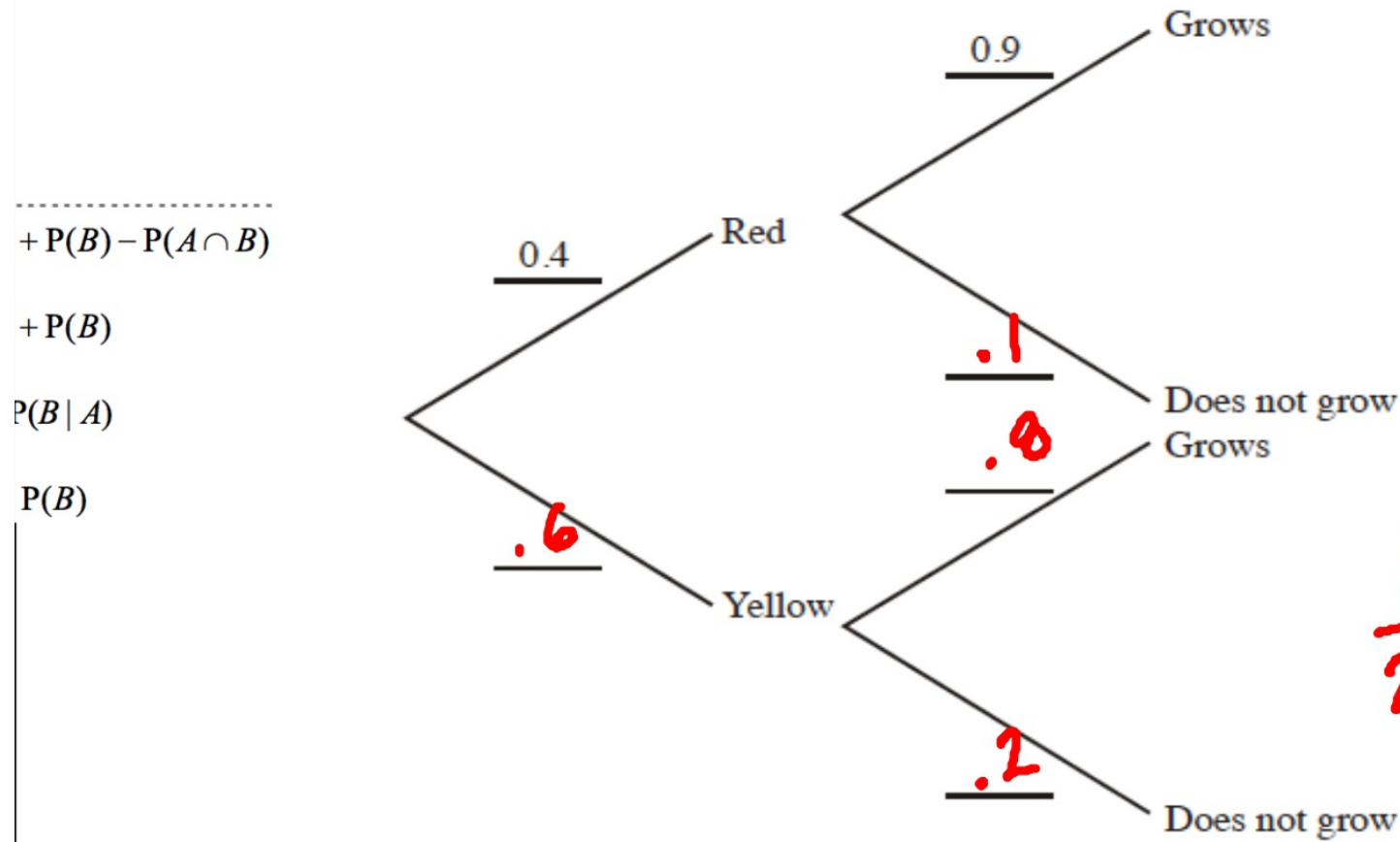
(c) Find  $P(A'|B)$ .

Given  
that

$$\frac{6/20}{7/20}$$

78.) A packet of seeds contains 40% red seeds and 60% yellow seeds. The probability that a red seed grows is 0.9, and that a yellow seed grows is 0.8. A seed is chosen at random from the packet.

(a) Complete the probability tree diagram below.



$$\frac{.36}{.84} = \frac{10}{21}$$

- (b) (i) Calculate the probability that the chosen seed is red and grows.  
 (ii) Calculate the probability that the chosen seed grows.  
 (iii) Given that the seed grows, calculate the probability that it is red.

$$.36 + .48 = .84$$

