M118
FALL 09

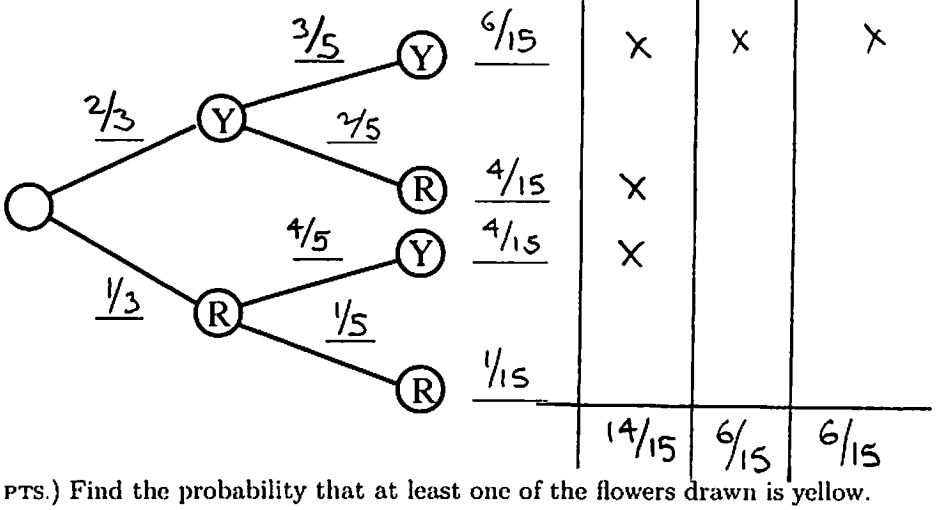
QUIZ 3

NAME: _____

1) A vase holds 4 yellow and 2 red flowers. Two flowers are drawn out at random, one after the other, without replacement.

a) (10 PTS.) Fill in the blanks on the following tree where the numbers in the right hand column indicate the probability of the corresponding outcome. One point per blank.

For example, the number that goes in right here ⇓ is the probability of drawing a yellow and then a yellow flower.



	A1Y	2Y	A1Y ∩ 2Y
6/15	X	X	X
4/15	X		
4/15	X		
1/15			
	14/15	6/15	6/15

b) (10 PTS.) Find the probability that at least one of the flowers drawn is yellow.

$Pr(A1Y) = 14/15$

Answer: *Pr[At least one YELLOW]* = $14/15$

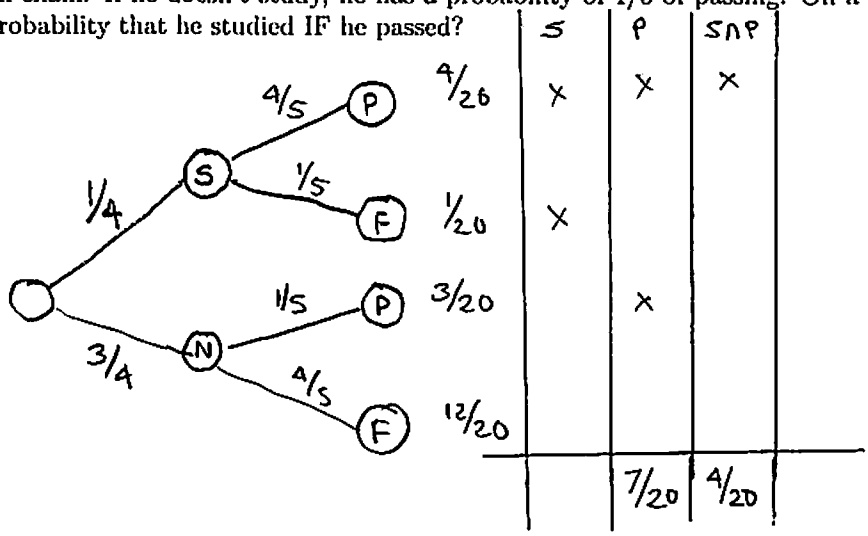
c) (15 PTS.) Find the probability that both flowers are yellow given that at least one of the flowers drawn is yellow.

$$Pr(2Y \mid A1Y) = \frac{Pr(2Y \cap A1Y)}{Pr(A1Y)} = \frac{6/15}{14/15} = \frac{3}{7}$$

Answer: *Pr[TWO YELLOWS given at least ONE YELLOW]* = $3/7$

SEE OTHER SIDE

2) (15 PTS.) Clyde studies for 1/4 of his exams (chosen at random). If he studies, he has a probability 4/5 of passing an exam. If he doesn't study, he has a probability of 1/5 of passing. On a randomly selected test, what is probability that he studied IF he passed?



$$Pr(S|P) = \frac{Pr(S \cap P)}{Pr(P)} = \frac{4/20}{7/20} = 4/7$$

Answer: $Pr[S|P] = \underline{4/7}$

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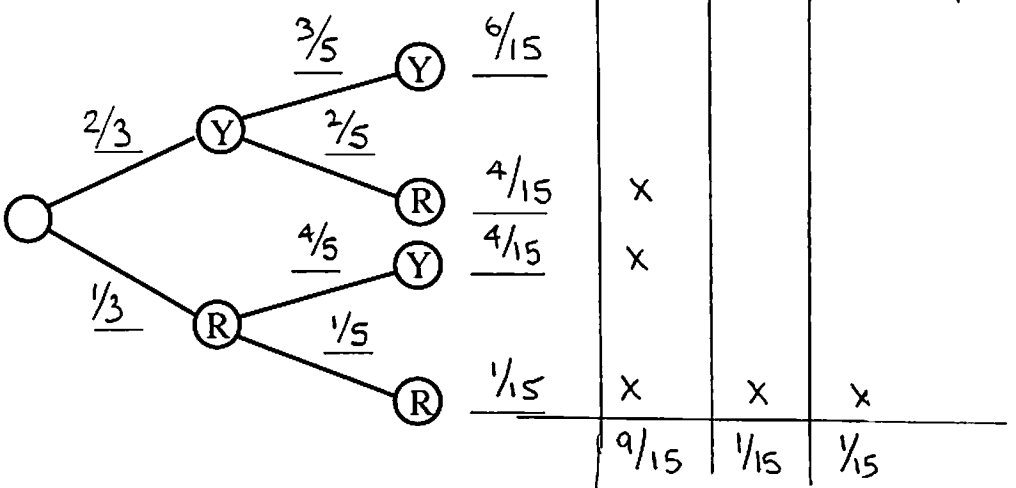
a) (10 PTS.) Fill in the blanks on the following tree where the numbers in the right hand column indicate the probability of the corresponding outcome. One point per blank.

For example, the number that goes in right here ⇓ is the probability of drawing a yellow and then a yellow flower.



	A1R	2R	2R∩A1R
6/15			
4/15	X		
4/15	X		
1/15	X	X	X
	9/15	1/15	1/15

b) (10 PTS.) Find the probability that at least one of the flowers drawn is red.

$Pr(A1R) = 9/15$

Answer: *Pr[At least one RED]* = $9/15$

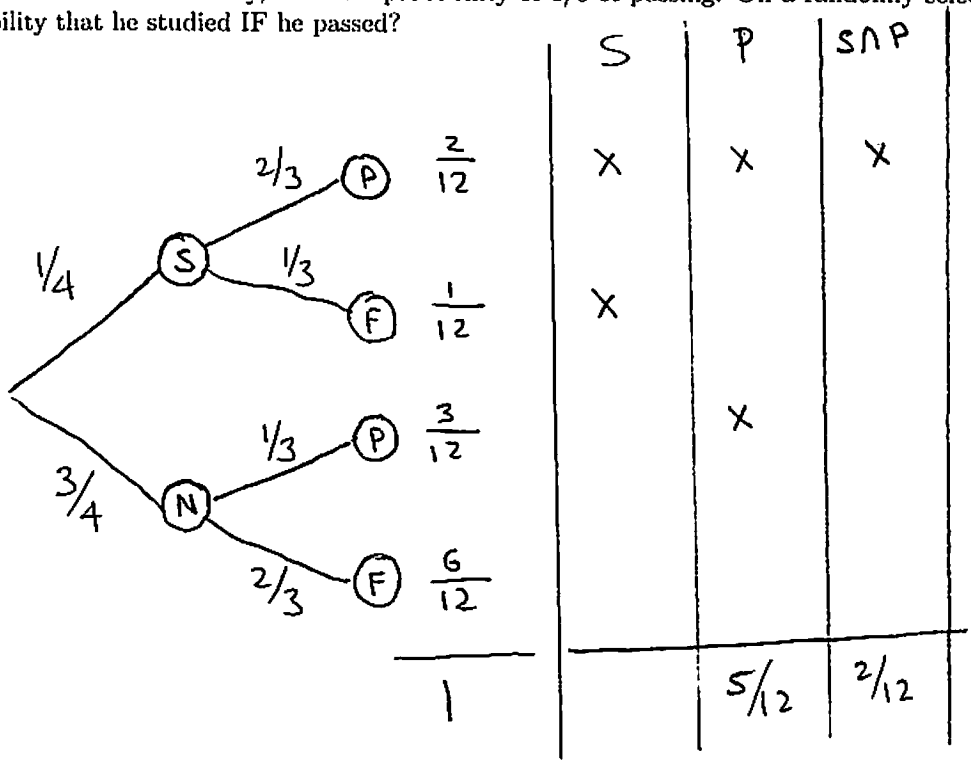
c) (15 PTS.) Find the probability that both flowers are red given that at least one of the flowers drawn is red.

$$Pr(2R \mid A1R) = \frac{Pr(2R \cap A1R)}{Pr(A1R)} = \frac{1/15}{9/15} = 1/9$$

Answer: *Pr[TWO REDS given at least ONE RED]* = $1/9$

SEE OTHER SIDE

2) (15 PTS.) Clyde studies for 1/4 of his exams (chosen at random). If he studies, he has a probability 2/3 of passing an exam. If he doesn't study, he has a probability of 1/3 of passing. On a randomly selected test, what is probability that he studied IF he passed?



$$Pr(S|P) = \frac{Pr(S \cap P)}{Pr(P)} = \frac{2/12}{5/12} = \frac{2}{5}$$

Answer: $Pr[S|P] =$ 2/5