

Name: _____

Show work needed to justify your answer.

Date: _____

HW: # 34: Math IBSL - Standard 33 - Probability Tree Diagrams

5 points

1 Three cards are drawn at random from a deck of playing cards. Each card is not replaced.

Find the probability of obtaining:

a three picture cards

b two picture cards.

P → Picture (J, Q, K)

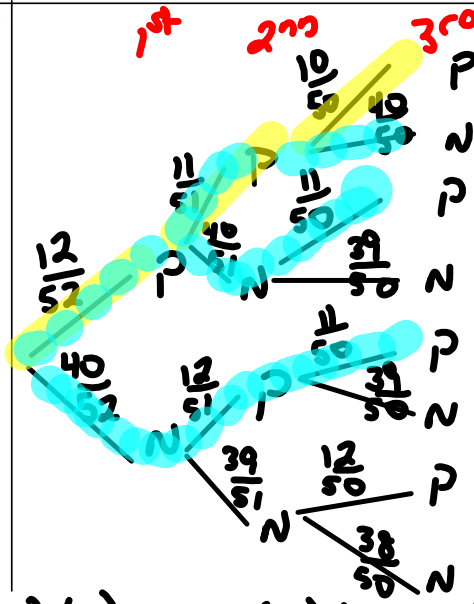
$$\frac{12}{52} \text{ or } \frac{3}{13}$$

N → No Picture A → 10

$$\frac{40}{52} \text{ or } \frac{10}{13}$$

$$(A) P(3P) = \left(\frac{12}{52}\right)\left(\frac{11}{51}\right)\left(\frac{10}{50}\right) = \boxed{\frac{11}{1105}}$$

$$(B) P(2P) = \left(\frac{12}{52}\right)\left(\frac{11}{51}\right)\left(\frac{40}{50}\right) + \left(\frac{12}{52}\right)\left(\frac{40}{51}\right)\left(\frac{11}{50}\right) + \left(\frac{40}{52}\right)\left(\frac{12}{51}\right)\left(\frac{11}{50}\right) = \boxed{\frac{132}{1105}}$$



2 A box of colouring pens contains five pens that are broken and nine pens that work.

Two children, a girl and a boy, each need to take a pen.

a What is the probability that two broken pens are chosen?

b What is the probability that at least one broken pen is chosen?

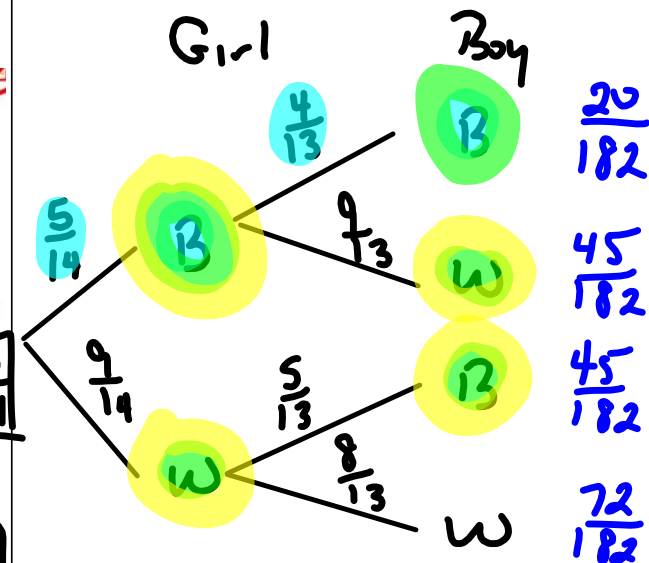
c If exactly one broken pen is chosen, what is the probability that the girl chose it?

$$(a) P(2B) = \left(\frac{5}{14}\right)\left(\frac{4}{13}\right) = \frac{20}{182} = \boxed{\frac{10}{91}}$$

$$(b) P(2B) + P(1B) = \frac{10}{91} + \left[2\left(\frac{45}{182}\right)\right]$$

$$\frac{10}{91} + \frac{45}{91} = \boxed{\frac{55}{91}}$$

$$(c) P(G \rightarrow B | \text{Exactly } 1B) = \boxed{\frac{1}{2}}$$



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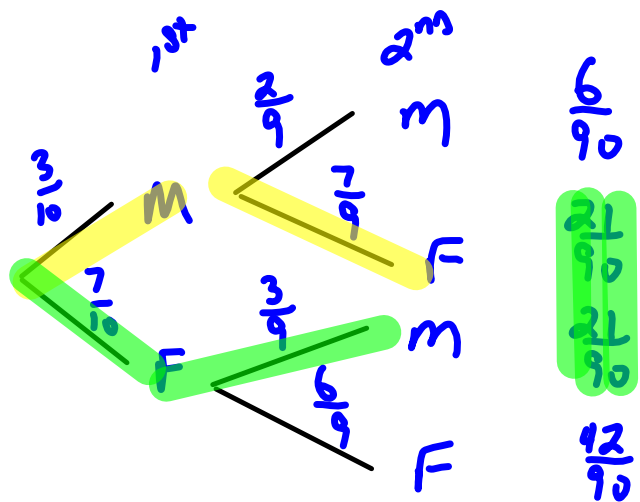
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- 3 The yearbook team has 10 members, of whom seven are female and three are male. One of the members is chosen at random to be the lead editor of the book.
- Find the probability that the chosen person is male.
 - Two people are chosen to take photographs at the school sports day. Find the probability that one is male and the other is female.

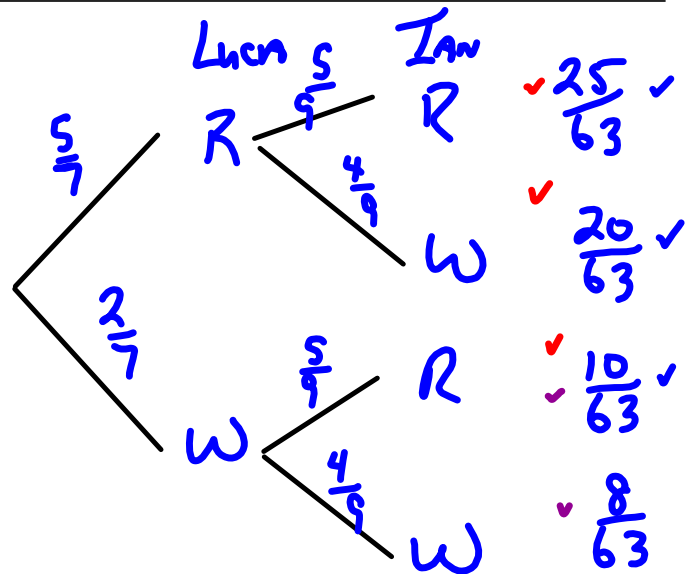


(a) $\frac{3}{10}$

(b) $\frac{42}{90}$ or $\frac{21}{45}$ or $\frac{7}{15}$

- 4 On average, Luca answers five problems correctly out of seven. Ian's average is five out of nine. They both attempt the same problem.

- What is the probability that at least one of the students answers the question correctly?
- If the question is answered correctly, what is the probability that Luca got the correct answer?
- If the question is answered correctly, what is the probability that Ian got the correct answer?
- If there was at least one correct answer what is the probability that there were two correct answers?



(a) $\frac{55}{63}$

(b) $\frac{45}{55} = \frac{9}{11}$

(c) $\frac{35}{55} = \frac{7}{11}$

(d) $\frac{25}{55} = \frac{5}{11}$