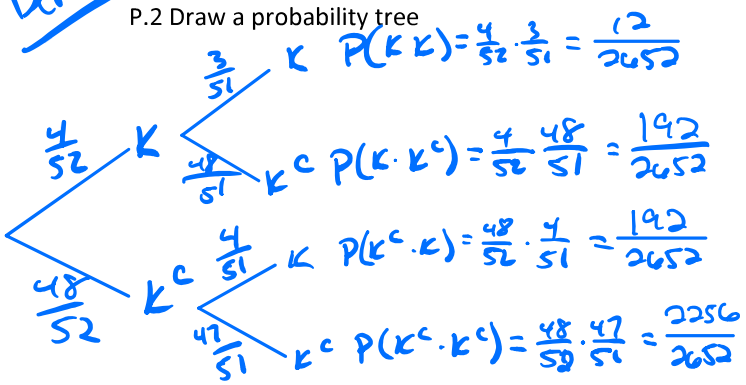
Tree Diagram

Hw Section P.2

A Kings Random

In a standard deck of 52 cards, you simultaneously pick two cards at random. You only care if you get a king or if you don't.

P.2 Draw a probability tree



P.2 Find the chance of getting 2 Kings.

$P(KK) = \frac{12}{2652}$

P.2 Find the probability of picking a King on your first and not picking a King on your second.

$P(K \cdot K^c) = \frac{4}{52}\frac{48}{51} = \frac{192}{2652}$

P.2 Find the probability of not picking a King on your first and picking a King on your second.

$P(K^c \cdot K) = \frac{48}{52} \cdot \frac{4}{51} = \frac{192}{2652}$

P.2 Find the probability of both cards not being Kings.

$P(K^c \cdot K^c) = \frac{48}{52} \cdot \frac{47}{51} = \frac{2256}{2652}$

P.3 Find P(King | King)

$P(K|K) = \frac{3}{51}$

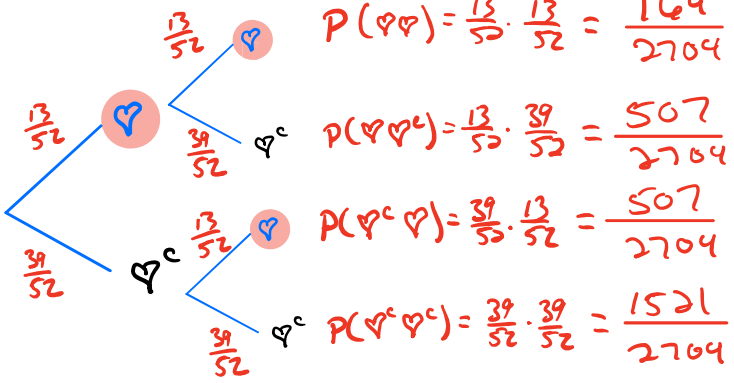
P.3 Find P(King^c | King)

$P(K^c|K) = \frac{48}{51}$

A Heart Returned

In a standard deck of 52 cards, you randomly pick a card, replace it, and randomly pick another card.

P.2 Draw a probability tree



P.2 Find the chance of getting 2 Hearts.

$P(\heartsuit\heartsuit) = \frac{13}{52} \cdot \frac{13}{52} = \frac{169}{2704}$

P.2 Find the probability of picking a Heart on your first and not picking a Heart on your second.

$P(\heartsuit\heartsuit^c) = \frac{13}{52} \cdot \frac{39}{52} = \frac{507}{2704}$

P.2 Find the probability of not picking a Heart on your first and picking a Heart on your second.

$P(\heartsuit^c\heartsuit) = \frac{39}{52} \cdot \frac{13}{52} = \frac{507}{2704}$

P.2 Find the probability of both cards not being Hearts.

$P(\heartsuit^c\heartsuit^c) = \frac{39}{52} \cdot \frac{39}{52} = \frac{1521}{2704}$

P.3 Find P(Heart | Heart)

$P(\heartsuit|\heartsuit) = \frac{13}{52}$

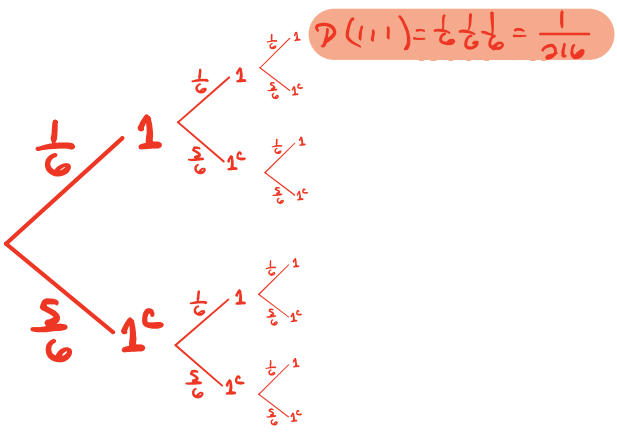
P.3 Find P(Heart^c | Heart^c)

$P(\heartsuit^c|\heartsuit^c) = \frac{39}{52}$

Tricycle INDY

You roll a die 3 times while riding a tricycle.

P.2 List the relevant sample space.



P.2 What is the probability you get a 1 on each die?

$P(1\,1\,1) = \frac{1}{6}\cdot\frac{1}{6}\cdot\frac{1}{6} = \frac{1}{216}$

P.3 Find P(1^c | 1^c)

$P(1^c \mid 1^c) =$ 5/6

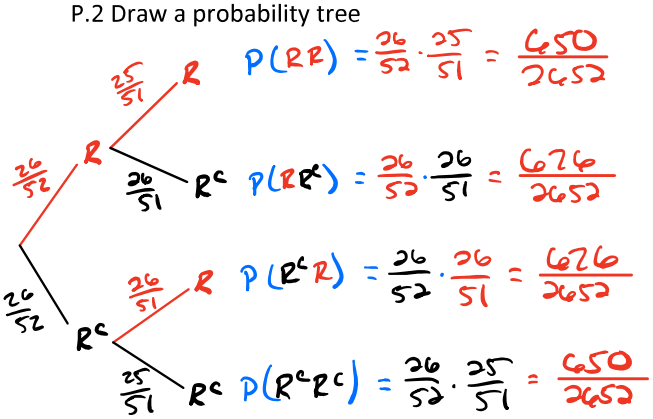
P.3 Find P (1 | 1)

$P(1 \mid 1) =$ 1/6

Reds DEPENDENT

In a standard deck of 52 cards, you are dealt two cards at random.

P.2 Draw a probability tree



P.2 Find the chance of getting 2 red cards.

$P(RR) = \frac{26}{52}\cdot\frac{25}{51} = \frac{650}{2652}$

P.2 Find the probability of receiving red on your first and not receiving red on your second.

$P(RR^c) = \frac{26}{52}\cdot\frac{26}{51} = \frac{676}{2652}$

P.2 Find the probability of both cards not being red.

$P(R^cR^c) = \frac{26}{52}\cdot\frac{25}{51} = \frac{650}{2652}$

P.3 Find P(R | R)

$P(R \mid R) = \frac{25}{51}$

P.3 Find P(R^c | R^c)

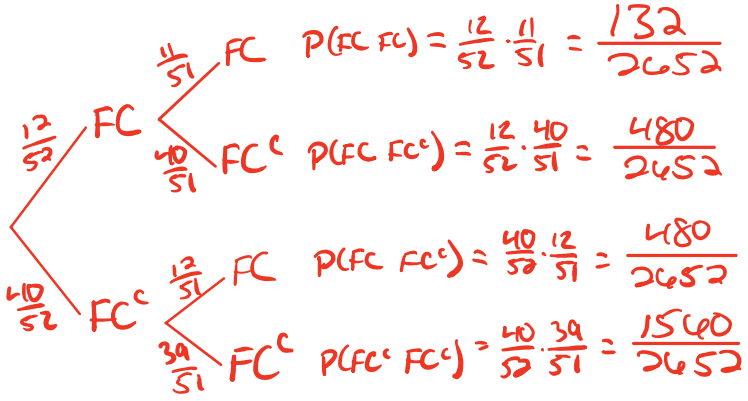
$P(R^c \mid R^c) = \frac{25}{51}$

DEPEDENT

Face Cards

In a standard deck of 52 cards, you pick two cards at random.

P.2 Draw a probability tree



P.2 Find the chance of getting 2 Face Cards.

$P(FC\ FC) = \frac{12}{52} \cdot \frac{11}{51} = \frac{132}{2652}$

P.2 Find the probability of picking a Face Card on your first and not picking a Face Card on your second.

$P(FC\ FC^C) = \frac{12}{52} \cdot \frac{40}{51} = \frac{480}{2652}$

P.2 Find the probability of not picking a Face Card on your first and picking a Face Card on your second.

$P(FC^C\ FC) = \frac{40}{52} \cdot \frac{12}{51} = \frac{480}{2652}$

P2. Find the probability of both cards not being Face Cards.

$P(FC^C\ FC^C) = \frac{40}{52} \cdot \frac{39}{51} = \frac{1560}{2652}$

P.3 Find P(Face Card | Face Card^C)

$P(FC \mid FC^C) = \frac{12}{51}$

P.3 Find P(Face Card^C | Face Card)

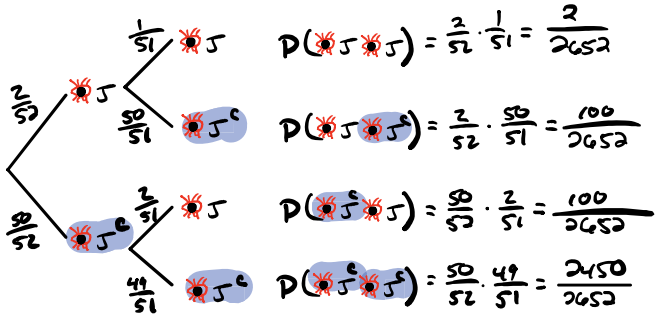
$P(FC^C \mid FC) = \frac{39}{51}$

INDY

One Eyed Jacks

In a standard deck of 52 cards, you randomly pick a card, replace it, and randomly pick another card.

P.2 Draw a probability tree



P2. Find the chance of getting 2 One Eyed Jacks.

$P(J\ J) = \frac{2}{52} \cdot \frac{1}{51} = \frac{2}{2652}$

P2. Find the probability of picking a One Eyed Jack on your first and not picking a One Eyed Jack on your second.

$P(J\ J^C) = \frac{2}{52} \cdot \frac{50}{51} = \frac{100}{2652}$

P2. Find the probability of not picking a One Eyed Jack on your first and picking a One Eyed Jack on your second.

$P(J^C\ J) = \frac{50}{52} \cdot \frac{2}{51} = \frac{100}{2652}$

P2. Find the probability of both cards not being One Eyed Jacks.

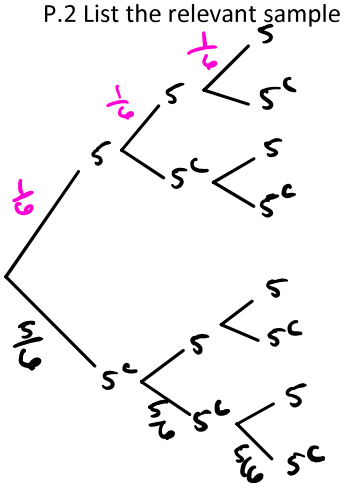
$P(J^C\ J^C) = \frac{50}{52} \cdot \frac{49}{51} = \frac{2450}{2652}$

1 of 4

Pentacycle

A die is rolled 3 times while the rider is on a pentacycle.

P.2 List the relevant sample space.



$P(5^c\,5^c\,5^c) = \frac{5}{6}\cdot\frac{5}{6}\cdot\frac{5}{6} = \frac{125}{216}$

P.2 What is the probability at least one 5 landing up?

$P(\text{At least one 5}) = 1 - P(\text{no 5})$

$= 1 - \frac{125}{216}$

$= \frac{216}{216} - \frac{125}{216}$

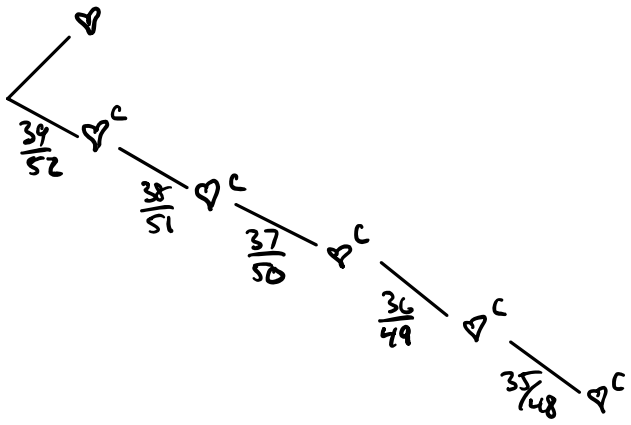
$P(\text{At least one 5}) = \frac{91}{216}$

Heart

In a standard deck of 52 cards, you are dealt 5 cards.

Dependent

P.2 Draw a probability tree



P2. What is the probability that at least one card is a heart?

$P(\text{At least 1 } \heartsuit) = 1 - P(\text{no } \heartsuit)$

$= 1 - \left(\frac{39}{52}\cdot\frac{38}{51}\cdot\frac{37}{50}\cdot\frac{36}{49}\cdot\frac{35}{48}\right)$

$= 0.778$

$= 77.8\%$

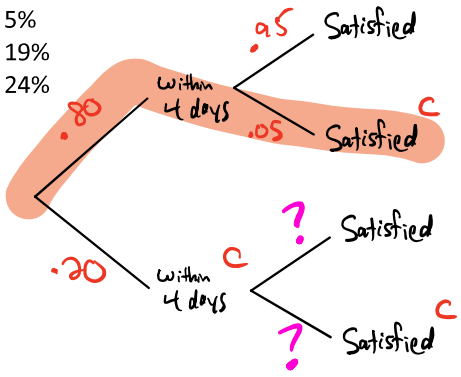
State Released 1

An online retailer conducts a random survey of its customers. The survey shows that 80% of the customers receive their purchases within four days, 95% of those customers are satisfied with the quality of their purchases.

What percent of all customers receive their purchases within four days and are not satisfied with the quality of their purchases?

Dependent

A) 4%
B) 5%
C) 19%
D) 24%



$P(\text{within 4 days and } S^c) = (.80)(.05) = .04$