

3.1

5)

coin 10 times

a) $(0.5)^{10} = 0.00098$

b) $(0.5)^{10} = 0.00098$

→ why exponent?

prob. of event $0 \leq P(A) \leq 1$

c) $P(\text{at least one tails}) = 1 - P(\text{no tails})$
 $= 1 - (0.5)^{10}$
 $= 1 - 0.00098$
 $= 0.99902$

7)

2373 random sample

35% independent

23% swing voters

11% both

49% only → rest is Dem. or Rep.

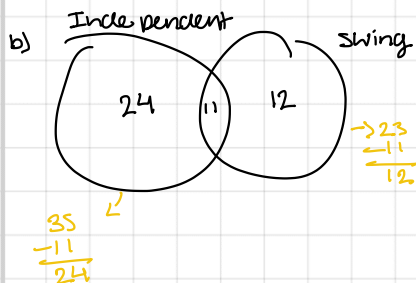
a) independent & swing disjoint?

0.35 independent

0.23 swing

→

not dis joint as probabilities don't equal one. There are also voters who are both



c) % of independent not swing voters → 24% (0.24)

d) % swing or independent → 24 + 11 + 12 → 47% (0.47)

e) neither Independent or swing → 100 - 47 = 53% (0.53)

f) $P(\text{independent}) \cdot P(\text{swing}) = 0.35 \cdot 0.23 = 0.08$

$P(\text{independent} \& \text{swing}) = 0.11$

Since they don't equal each other, they are dependent

11)

a) Choose a man w/ at least a bachelors → $0.16 + 0.09 = 0.25$

b) woman w/ at least bachelors → $0.17 + 0.09 = 0.26$

c) Assuming education level is independent → $0.26 \cdot 0.25 = 0.065$

d) NO. People marry others w/ comparable education levels

3.2

13)

$$P(A) = 0.3 \quad P(B) = 0.7$$

a) No, we could though if $P(A) \neq P(B)$ are independent

b) i) $P(A \cap B) = 0.3 (0.7) = 0.21$

ii) $P(A \text{ or } B) = 1 - 0.21$
 $\boxed{= 0.79}$

iii) $P(A|B) = \frac{P(A \cap B)}{P(B)} = \frac{0.21}{0.7} = 0.3$

15)

a) No. 0.18 fall into this category

b) $P(\text{someone chosen believes the earth is warming} \mid \text{they're Liberal}) = P(A) + P(B) - P(A \cap B)$
 $= 0.60 + 0.20 - 0.18$
 $\boxed{= 0.62}$

c) $P(\text{believes earth is warming} \mid \text{given he is Liberal}) = 0.18 / 0.20 \quad \boxed{= 0.9}$

d) $P(\text{believes earth is warming} \mid \text{given he is republican}) = 0.11 / 0.33 \quad \boxed{= 0.33}$

e) no \rightarrow then c & d would be the same

f) $P(\text{randomly chosen is moderate / Lib Republican given that he doesn't believe the earth is warming}) \rightarrow 0.06 / 0.34 \quad \boxed{= 0.18}$