Quiz 2 question
Posted: 01-30-2014 03:10 PM

Among 9 electrical components exactly one is known not to function properly. If 4 components are randomly selected, find the probability that at least one does not function properly.

a) 0.5556
b) 0.7023
c) 0.4444
d) 0.8889
e) 0.3333
f) None of the above

8 function

1 or 2 or 3 or 4

0 + 0 + 0

$$\frac{{}_1C_1 \; {}_8C_3}{{}_9C_4} = \frac{56}{126} = .4444$$

Math → PROB → nCr

19 components 5 dont function 14 do function Choosing 4

P(at least one doesnt function)

$$= P(1 \text{ not funct}) + P(2) + P(3) + P(4)$$

$$= \frac{{}_5C_1 \cdot {}_{14}C_3}{{}_{19}C_4} + \frac{{}_5C_2 \cdot {}_{14}C_2}{{}_{19}C_4} + \frac{{}_5C_3 \cdot {}_{14}C_1}{{}_{19}C_4} + \frac{{}_5C_4}{{}_{19}C_4}$$

(3876)

hwk 3, Q 8
Posted: 01-30-2014 02:50 PM

Suppose a box contains 3 defective light bulbs and 12 good bulbs. Two bulbs are chosen from the box without replacement. To find the probability that one of the bulbs drawn is good and one is defective, what expression would you use?

15 total 3D, 12G

$_{15}C_2 = n(S) = 105$

P(1G and 1D)

$$\frac{{}_{12}C_1 \cdot {}_3C_1}{{}_{15}C_2} = \frac{12 \cdot 3}{105}$$

a. $\frac{12}{15} + \frac{3}{14}$ ←

b. $\frac{12}{15} \cdot \frac{3}{14}$

c. $\frac{12}{15} \cdot \frac{3}{15} + \frac{3}{15} \cdot \frac{2}{15}$

(d.) $\frac{12}{15} \cdot \frac{3}{14} + \frac{3}{15} \cdot \frac{12}{14}$

$\frac{12}{15} \cdot \frac{3}{14} + \frac{3}{15} \cdot \frac{12}{14}$

G B or B G

$\frac{g}{15} \cdot \frac{b}{14}$ or $\frac{b}{14} \cdot \frac{g}{15}$

Use the following to answer questions 11-15:

$$P(E)=0.56, P(F)=0.37, P(E\cup F)=0.78$$

11. $P(E\cap F)=$
    a. 0.93
    b. 0.21
    c. 0.15
    d. 0.78
    e. none of these

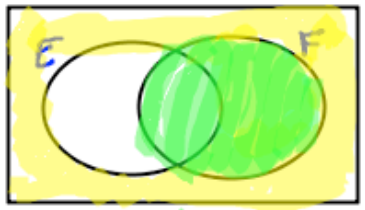
$P(E\cup F) = P(E)+P(F)-P(E\cap F)$

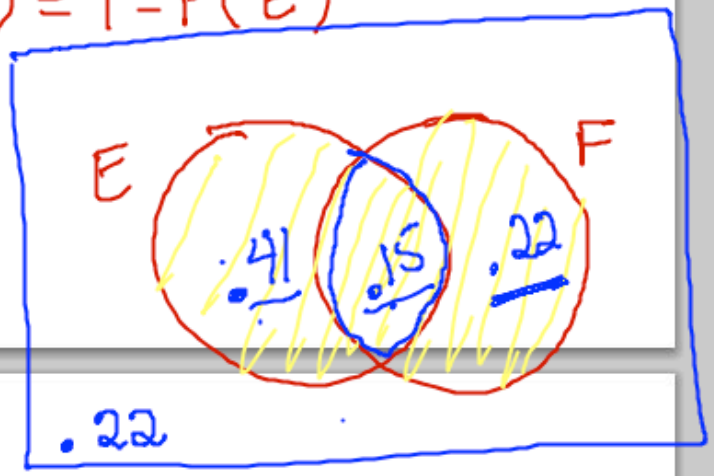
$.56+.37$

$.93 - \square = .78$

12. $P(E^C\cup F)=$
    a. 0.59
    b. 0.15
    c. 0.22
    d. 0.44
    e. none of these

$P(E^c) = 1-P(E)$





13. $P(E\mid F)=$ $\dfrac{P(E\cap F)}{P(F)}$
    a. 0.4744
    b. 0.5676
    c. 0.2679
    d. 0.4054
    e. none of these

14. $P(F\mid E)=$ $\dfrac{P(E\cap F)}{P(E)}$
    a. 0.4744
    b. 0.5676
    c. 0.2679
    d. 0.4054
    e. none of these

Operations of Probabilities

$\cup$ union "or"

$\cap$ intersection "and"

$|$ given $P(K|H)$

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

$$P(A \cap B) = P(A) + P(B) - P(A \cup B)$$

If A and B are independent then $P(A \cap B) = P(A)\,P(B)$

not independent: $P(A \cap B) = P(A|B)\,P(B)$

$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$

2.3

28. Donald has ordered a computer and a desk from 2 different stores. Both items are to be delivered Tuesday. The probability that the computer will be delivered before noon is .6 and the probability that the desk will be delivered before noon is .8. If the probability that either the computer or the desk will be delivered before noon is .9, what is the probability that both will be delivered before noon?

$P(C) = .6$

$P(D) = .8$

$P(C \cup D) = .9$

$P(C \cap D) = ?$

$U = \{1,2,3,4,5,6,7,8,9,10\}$

$A = \{2,4,6,8,10\}$

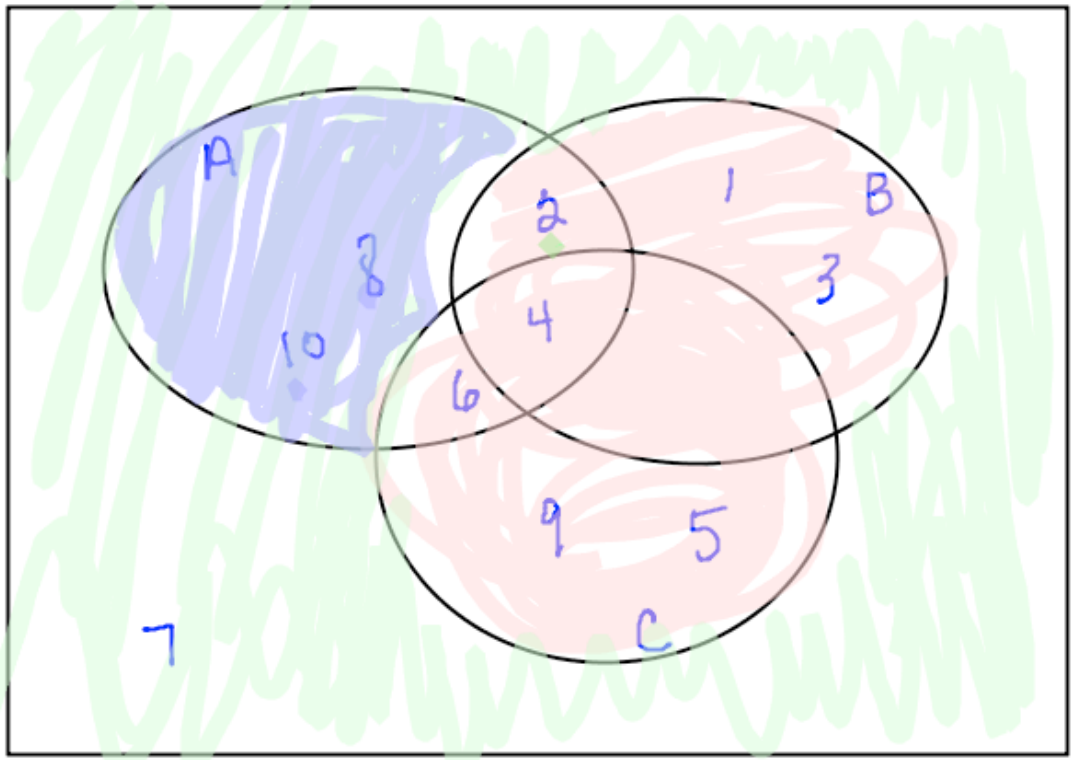
$B = \{1,2,3,4\}$

$C = \{4,5,6,9\}$

6. $A \cap (B \cup C)^c =$

$B \cup C = \{1,2,3,4,5,6,9\}$

$(B \cup C)^c = \{7,8,10\}$

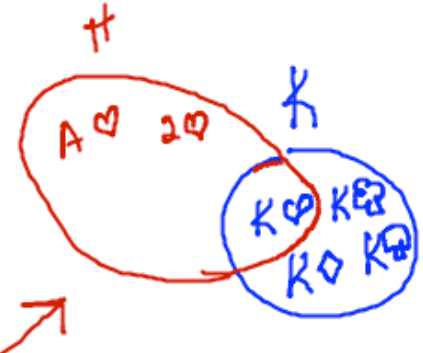


Mutually Exclusive, disjoint

$A \cap B = \emptyset$

$P(A \cap B) = 0$

can't both happen



10. A: King of Hearts

D. 3 & 3 double that is a 6

C. K/A in same card

21. Thirty percent of the students at a local high school face a disciplinary action of some kind before they graduate. Of those "felony" students, 40% go on to college. Of the ones who do not face a disciplinary action, 60% go on to college.

a. What is the probability that a randomly selected student both faced a disciplinary action and went on to college?
b. What percent of the students from the high school go on to college?
c. Show if events {faced disciplinary action} and {went to college} are independent or not.

F = got in trouble

C = go to college

$P(F) = .3$ $\Leftarrow$ $P(F^c) = .7$

$P(C|F) = .4 = \frac{P(C \cap F)}{P(F)}$

$P(C|F^c) = .6 = \frac{P(C \cap F^c)}{P(F^c)}$

a) $P(F \cap C) = .12$ $\quad .4 = \frac{P(F \cap C)}{.3}$

b) $P(C) = P(F \cap C) + P(F^c \cap C)$

$.12 + .42 = .54$

X	-18	-14	2	11	20
P(X)	1/25	3/50	1/20	1/100	___

Prob. distribution

sum = 1

2.4 22d independent?

$P(\text{single family}) \cdot P(\text{fixed mortgage})$

$= P(S \cap M) = .1$

$(.5)(.3) = .15 \neq .1$

NO