

Example 6 Show p. 45. ex. 3. 14

A class contain 10 men and 20 women of which half the men and half the women have brown eyes, find the probability that a person chosen at random is a man or has brown eyes.

A = a person is a man.

B = a person has brown eyes.

we seek $P(A \cup B)$

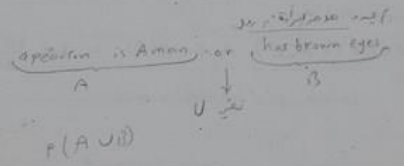
$$P(A) = \frac{n(A)}{n} = \frac{10}{30}$$

$$P(B) = \frac{n(B)}{n} = \frac{15}{30}$$

$A \cap B = \{ \text{a person is a man and has brown eyes} \}$.

$$P(A \cap B) = \frac{5}{30}$$

$$\begin{aligned} \therefore P(A \cup B) &= P(A) + P(B) - P(A \cap B) \\ &= \frac{10}{30} + \frac{15}{30} - \frac{5}{30} = \frac{20}{30} \end{aligned}$$



example 8 show p. 48. ex. 3. 144

class contain 10 men and 20 women of which half the men and half the women have brown eyes, find the probability that a person chosen at random is a man or has brown eyes.

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$(A \cup B)$ المثلث

لم يجد الشخص
هو رجل ام امرأة

\cap تقاطع

we see $K(A \cup B)$

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

$$= \frac{10}{30} + \frac{15}{30} - \frac{5}{30} = \boxed{\frac{20}{30}}$$

ايمان عبد المطلب
apearton is Aman . or has brown eyes
A ↓ B
نظر

ex. ① ②.

If the prob. are 0.25, 0.29 and 0.18 that it will rain in a certain day in March, that there will be heavy winds, ~~or~~ that there will be rain and heavy winds, what is the prob. that there will be rain or heavy winds on a such day?

R = represents rain

H = represents heavy winds.

$$P(R) = 0.25$$

$$P(H) = 0.29$$

$$P(R \cap H) = 0.18.$$

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H = represents heavy winds.

$$P(R) = 0.25$$

$$P(H) = 0.29$$

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and

$$P(R \cup H) = P(R) + P(H) - P(R \cap H)$$

$$= 0.25 + 0.29 - 0.18$$

$$= \boxed{0.36}$$

ex. 10.

If the prob. are 0.25, 0.29 and 0.18 that it will rain in a certain day in March, that there will be heavy winds, that there will be rain and heavy winds, what is the prob. that there will be rain or heavy winds on a such day?

R = represents rain
H = represents heavy winds.

$$P(R) = 0.25$$

$$P(H) = 0.29$$

$$P(R \cap H) = 0.18$$

and

$$\begin{aligned} P(R \cup H) &= P(R) + P(H) - P(R \cap H) \\ &= 0.25 + 0.29 - 0.18 \\ &= \boxed{0.36} \end{aligned}$$

ex. 11.10.

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and

$$P(R \cup H) = P(R) + P(H) - P(R \cap H)$$

$$= 0.25 + 0.29 - 0.18$$

$$= \boxed{0.36} .$$

ex. 13

H.w.

بیم شمار (5)

15 books, selected from 18 books

- (A) what is the prob. that a certain 4 book must be chosen
- (B) what is the prob. that is a certain one books must be left.

certain

$$P(A) = \frac{C_4^4 \cdot C_{14}^{11}}{C_{18}^{15}}$$

left

$$P(B) = \frac{C_0^1 \cdot C_{17}^{15}}{C_{18}^{15}}$$

13

H.w. بیم شمار (3)

ex. 14

show p. 42. ex. 3.8.

ex. 14

show: p. 42. ex. 3.8

Let 2 items be chosen at random from a lot containing 12 items of which 4 are defective.

Let A = both items are defective

B = " " = non defective.

C = one item is defective & the other is not defective.

$$P(A) = \frac{{}^4C_2}{{}^{12}C_2} = \frac{6}{66} = \boxed{\frac{1}{11}}$$

$$P(B) = \frac{{}^8C_2}{{}^{12}C_2} = \frac{28}{66} = \boxed{\frac{14}{33}}$$

$$P(C) = \frac{{}^4C_1 \cdot {}^8C_1}{{}^{12}C_2} = \frac{32}{66}$$

Ex. (10)

A person is looking for a new car. If the prob. he will buy a passat, a fiat, or a Toyota are 0.17, 0.22, ^{and} 0.08, what is the prob. that he will buy one of the three.

sol

Since the three possibilities are mutually exclusive then

$$P(A \cup B \cup C) = P(A) + P(B) + P(C)$$

$$= 0.17 + 0.22 + 0.08$$

$$= \boxed{0.47}$$

Ex. 12

Shom. p. 47. ex. 3, 13

Six married couples are standing in a room

(i) if 2 people are chosen at random. find the prob. that.

(a) they are married.

(b) one is male and one is female.

(ii)

A = they are married

B = one is male and one is female.

$$P(A) = \frac{C_1^6}{C_2^{12}} = \frac{6}{66} = \frac{1}{11}$$

$$P(B) = \frac{C_1^6 \cdot C_1^6}{C_2^{12}} = \frac{(6) \cdot (6)}{66} = \frac{6}{11}$$

a men and
that a person

Ex. 12

Six married couples are standing in a room

- (i) if 2 people are chosen at random. find the prob. that.
- they are married.
 - one is male and one is female.

(ii)

A = they are married

B = one is male and one is female.

$$P(A) = \frac{C_1^6}{C_2^{12}} = \frac{6}{66} = \frac{1}{11}$$

$$P(B) = \frac{C_1^6 \cdot C_1^6}{C_2^{12}} = \frac{(6)(6)}{66} = \frac{6}{11}$$

- (c) one is male and one is female not married.

- (C) one is male and one is female not married.
- (D) there are not married.

$$P(C) = \frac{C_1^6 \cdot C_1^5 + C_1^5 \cdot C_1^6}{C_2^{12}}$$
 نتبعه امرأة تقدم $C_1^6 \cdot C_1^5$
 ضيفنا $C_1^5 \cdot C_1^6$

ابلا و امرا
 غير متزوجين

$$P(D) = \frac{C_2^6 + C_2^6 + C_1^6 \cdot C_1^5 + C_1^5 \cdot C_1^6 + C_1^6 \cdot C_1^5}{C_2^{12}}$$
 الإناث رجال
 الإناث
 رجل
 امرا
 غير متزوجين

الرجال
 متزوجين

المتزوجين
 غير
 متزوجين
 غير متزوجين
 غير متزوجين
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