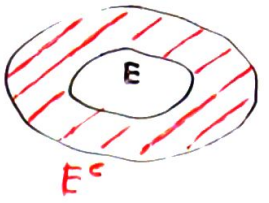
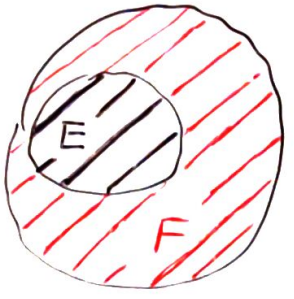
ES 2.1

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

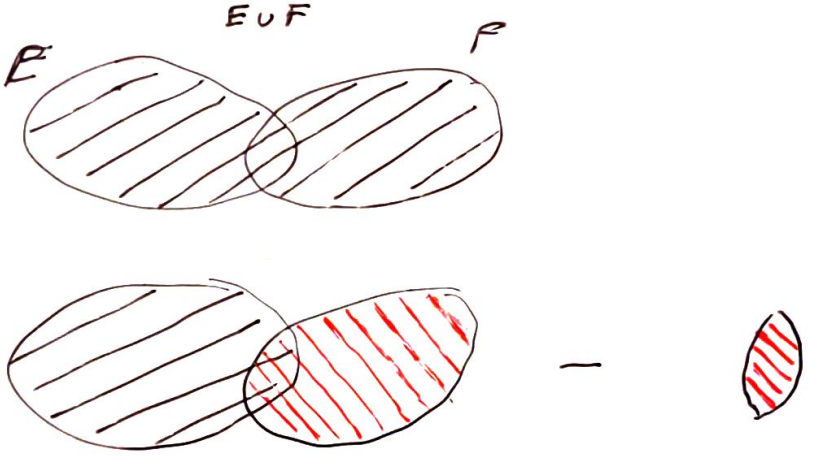
$P = 1$



2. Se $E \subseteq F$, $P(E) \leq P(F)$



3. $P(E \cup F) = P(E) + P(F) - P(EF)$



E 2.2

10 D

5 U

$\binom{15}{5} \quad \frac{15!}{5!\,10!} = \frac{15 \cdot 14 \cdot 13 \cdot 12 \cdot 11 \cdot 10!}{5! \cdot 10!}$

$= 3003$

Quanti gruppi 3 D e 2 U

$\binom{10}{3} = \frac{10!}{3!\,7!} = \frac{10 \cdot 9 \cdot 8 \cdot 7!}{3 \cdot 2 \cdot 7!} = 120$

$\binom{5}{2} = \frac{5!}{2!\,3!} = \frac{5 \cdot 4 \cdot 3!}{2 \cdot 3!} = 10$

$\Rightarrow \quad \frac{1200}{3003} \simeq 40\,\%$

ES 2.3

52

POKER 4 carte stesso tipo

$\binom{52}{5}$ no carti possibili

n° carti fav. $13 \cdot \binom{52-4}{}$

$13 \cdot 48 / \binom{52}{5} = 2{,}4 \cdot 10^{-4}$

SCALA REALE

TOT 13 (5 carte) consecc.

14

10 carti $10 \cdot 4$ (semi)

$40 / \binom{52}{5} = 1{,}5 \cdot 10^{-5}$

ES 2.4

7 numeri

3 NUM PARI (15)

4 NUM MIN 10

N_{30} $\binom{30}{7} = \frac{30!}{7!\,23!} = 2\,035\,800$

$\binom{15}{3} = \frac{15!}{3!\,12!} = \frac{15 \cdot 14 \cdot 13 \cdot 12!}{3!\,12!} = \frac{2730}{6} = 455$

$\binom{10}{4} = \frac{10!}{4!\,6!} = \frac{10\,9\,8\,7\,6!}{4 \cdot 3 \cdot 2 \cdot 6!} = 210$

$$\binom{15}{3} \cdot \binom{10}{4} = 95\,550$$

$$\Rightarrow \quad \frac{95\,550}{2\,035\,700} = 0{,}0469 \simeq 5\,\%$$

2.5

10 PALLINE — 6 BLU, 4 ROSSE — 1 R e 1 B ?

CASI POSSIBILI $\binom{10}{2} = \frac{10 \cdot 9 \cdot 8!}{2!\ 8!} = 45$

$\binom{6}{1} = \frac{6 \cdot 5!}{1! \cdot 5!} = 6$ $\qquad \binom{4}{1} = 4$

$\binom{6}{1} \cdot \binom{4}{1} = 6 \cdot 4 = 20$

$\frac{20}{45} = 0{,}44 \Rightarrow 44\,\%$