

Ground Rules: Time allowed is 10 minutes, individual work only and closed book test.

Your name Solution

Score :

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1. Suppose there are only thirteen teams with a non-zero chance of winning the next World Cup. Suppose those teams are Spain (with a 14% chance), the Netherlands (with a 14% chance), Germany (with a 11% chance), Italy (with a 7% chance), Brazil (with a 10% chance), England (with a 9% chance), Argentina (with a 9% chance), Russia (with a 7% chance), France (with an 9% chance), Turkey (with a 4% chance), Paraguay (with a 4% chance), Croatia (with a 1% chance) and Portugal (with a 1% chance).

- (a) What is the probability that the next World Cup will be won by a South American country?
 (b) What is the probability that the next World Cup will be won by a country that is not from South America?

Sample space $S = \{ \text{list of all countries in the world cup} \}$

(a) $E = \{ \text{world cup will be won by South American country} \}$

$= \{ \text{Brazil (or) Paraguay, (or) Argentina} \}$
win win win

$$P(E) = P(\{ \text{Brazil} \}) + P(\{ \text{Paraguay} \}) + P(\{ \text{Argentina} \})$$

(win?) win win win

$$= 0.1 + 0.04 + 0.09 = 0.23$$

1

(b) $P(E^c) = 1 - P(E) = 1 - 0.23 = 0.77$