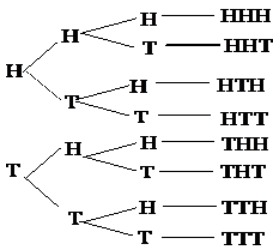
Classwork 1

1) By using tree diagram write down the sample space when a coin is tossed three times?

Solution:



$S = \{HHH, HHT, HTH, HTT, THH, THT, TTH, TTT\}$

2) What is the sample space for choosing a prime number less than 15 at random?

Solution: S={2,3,5,7,11,13}

3) What is the sample space for counting the number of females in a group of *n* people?

Solution: S= {0 female, 1 female, …, n female}

4) What is the sample space for the number of aces in a hand of 13 playing cards?

Solution: S = {0,1,2,3,4}

5) What is the sample space for a person's birthday?

Solution: S = {January 1, January 2, ... , February 29, ... , December 31}

6) A car repair is performed either on time or late and either satisfactory or unsatisfactory. What is the sample space for a car repair?

Solution: S = {(on time, satisfactory), (on time, unsatisfactory),
(late, satisfactory), (late, unsatisfactory)}

7) If a card is chosen at random from a pack of cards, what is the probability that the card is from one of the two black suits?

Solution: 26/52

8) An experiment has five outcomes, I, II, III, IV, and V. If

P(I) = 0.13, P(II) = 0.24, P(III) = 0.07, and P(IV) = 0.38, what is P(V)?

Solution: P(I) + P(II) + P(III) + P(IV) + P(V) = 1

$\Rightarrow$ 0.13 + 0.24 + 0.07 + 0.38 + P(V) = 1

$\Rightarrow$ P(V) = 0.18

9) An experiment has five outcomes, I, II, III, IV, and V. If *P(I)* = 0.08, *P(*II*)* = 0.20, and *P(*III*)* = 0.33, what are the possible values for the probability of outcome V? If outcomes IV and V are equally likely, what are their probability values?

Solution: P(I) + P(II) + P(III) + P(IV) + P(V) = 1
$\Rightarrow$0.08 + 0.20 + 0.33 + P(IV) + P(V) = 1
$\Rightarrow$ P(IV) + P(V) = 1 − 0.61 = 0.39
Therefore, $0 \leq$ P(V) $\leq$ 0.39.
If P(IV) = P(V) then P(V) + P(V) = 0.39
$\Rightarrow$P(V) = 0.195.

10) A card is chosen from a pack of cards. Are the events that a card from one of the two red suits is chosen and that a card from one of the two black suits is chosen mutually exclusive? What about the events that an ace is chosen and that a heart is chosen?

Solution: Yes

no