FOM 12

Card Problems

Name: Key

A standard deck of 52 playing cards consists of 4 suits (spades, hearts, diamonds, and clubs) of 13 cards each.

1. How many ways can you pull either a black jack or a heart from a standard deck of cards?

black Jacks = 2
hearts = 13

$2 + 13 = \boxed{15}$

2. How many ways call you pull either a spade or a jack from a standard deck of cards?

spades = 13
jacks = 4
JQ = 1 ← overlap!

$13 + 4 - 1 = \boxed{16}$

3. How many different 5-card hands can be formed?

use *Combinations (we don't care about the order in which they are dealt)

$_{52}C_5 = \boxed{2\,598\,960}$

4. How many different 5-card hands can be formed that consist of all hearts?

13 hearts

$_{13}C_5 = \boxed{1287}$

5. How many different 5-card hands can be formed that consist of all face cards?

4 suits × JQK = 12 face cards

$_{12}C_5 = \boxed{792}$

6. How many different 5-card hands can be formed that consist of 3 hearts and 2 spades?

choose 3 hearts AND choose 2 spades

$_{13}C_3 \times {}_{13}C_2 = 286(78)$

$= \boxed{22\,308}$

13 hearts
39 other cards

7. How many different 5-card hands can be formed that consist of at least 3 hearts?

3 hearts and 2 others → $_{13}C_3 \times {}_{39}C_2 = 211\,926$

OR

+

4 hearts and 1 other → $_{13}C_4 \times {}_{39}C_1 = 27\,885$

OR

+

5 hearts and 0 others → $_{13}C_5 \times {}_{39}C_0 = 1287$

241 098

8. How many different 5-card hands can be formed that consist of at most 1 black card?

26 black cards
26 red cards

choose no black and choose 5 red

No black cards → $_{26}C_0 \times {}_{26}C_5 = 65\,780$

OR

+

1 black card → $_{26}C_1 \times {}_{26}C_4 = 388\,700$

454 480

1. 15
2. 16
3. 2 598 960
4. 1287
5. 792
6. 22 308
7. 241 098
8. 454 480