Probability

1) • Total ways to choose 2 marbles from 15 = $\binom{15}{2} = 105$
• probability that none is green = choose 2 from non-green
marbles = 3 (blue) + 4 (Red) + 2 (Yellow) = 9
$^9C_2 = 36$
So, probability of at least one green
$= 1 - \frac{36}{105} = \frac{69}{105} = \frac{23}{35}$

2) Probability that both marbles are either blue or yellow
Total favorable cases
• choose 2 blue :- $\binom{3}{2} = \frac{3\times2}{2\times1} = 3$
• choose 2 yellow :- $\binom{2}{2} = 1$
- choose 1 blue & 1 yellow = $3 \cdot 2 = 6$
Total favorable = 3+1+6 = 10
Total possible = $^{15}C_2 = 105$ Probability = $10/105 = 2/21$

3) Non-blue marbles = 15 − 3 = 12
favorable ways = choose 4 from 12 = $^{12}C_4 = 495$
Total ways = $^{15}C_4 = 1365$
probability = $495/1365 = 11/33 = 1/3$

4) ~~No~~ No of arrangements keeping the pair together =
$9! \times 2!$ - Total arrangements = 10!
Pro = $\frac{9! \times 2!}{10!} = \frac{2}{10} = \frac{1}{5}$

5) leap year has 366 days = 52 weeks + 2 extra days
for 53 sundays, sunday must be one of the extra days ⇒
favorable outcomes -
pro = 2/7
only (sat, sun) has 53 sunday and 52 Monday.
so only 1 favorable case :- $1/7$

6) In 20 consecutive integers
- 10 even; 10 odd.
ways to choose 1 even & 1 odd = $10 \times 10 = 100$ =

papergrid

Date: / /

Total ways to choose 2 no's

$= {}^{20}C_2 = 190$

$P = \frac{100}{190} = \frac{10}{19}$

7. ways to choose 1 yellow $({}^{2}C_1) = 2$

ways to choose 2 red $({}^{4}C_2) = 6$

Total favorable $= 2 \times 6 = 12$

Total ways to choose 3 from 15 $= {}^{15}C_3 = 455$

$P = 12/455 = 12/455 = \frac{12}{455}$

8. Total ways to choose 3 $= {}^{10}C_3 = 120$

Probability of no graduate $= {}^{6}C_3 = 20$

Probability (at least one grad) $= 1 - \frac{20}{120} = \frac{100}{120} = \frac{5}{6}$

9. Total ppl = 10 (5 couples)

- Total ways to choose 5 people from 10 =

$ {}^{10}C_5 = 252$.

- choose 2 couples = from 5 ${}^{5}C_2 = 10$
- from remaining 6 people (10−4), choose 1 person $({}^{6}C_1) = 6$
- Total ways with exactly 2 couples $= 10 \cdot 6 = 60$

choose 3 couples $= {}^{5}C_3 = 10$

- Total ways with at least 2 couples =

$60 + 10 \cdot 6 = 60 + 60 = 120$

Probability $= \frac{120}{252} = \frac{10}{21}$.

10. Probability of not working $= 1 - 0.2 = 0.8$

- Probability none of the 4 tickets win $= 0.8^4 = 0.4096$

So, probability:

$1 - 0.4096 = 0.5904$

Date: / /

Number Series.

1) 23, 28, 38, 53, 73, 98

28-23 = 5

38-28 = 10

53-38 = 15

73-53 = 20

73+25 = 98

2. 17, 45, 148, 607, ?, 1833!

17 → 45 =

17×2 = +11 = 45

45 →

45×3+13 = 148

148 → 607

148 × 4+15 = 607

607×5+17 = 3035+17 = 3052

3. 5, 366, 655, ?, 1049, 1170

366-6 = 361

655-366 = 289

?-655 = ?

1049 - ? = ?

1170-1049 = 121

361 = 19²

289 = 17

Next = 15² = 225

→ 655+225 = 880

Then 1049-880 = 169 = 13²

ans = 880

4. 1598, 798, 398, 198, ?, 48

1598 - 798 = 800

798 - 398 = 400

398 - 198 = 200

198 - ? = 100

→ = 198 - 100 = 98

= 98 - 48 = 50

ans = 98