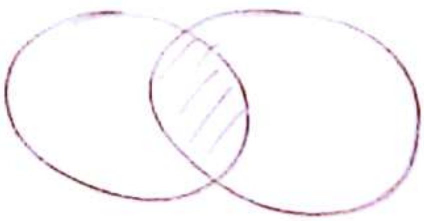
3 8
1 2
↓

$$\frac{(2^3 \times 3 - 3)}{3^3} = \frac{21}{27}$$

18 see at least 2

3 · 3 see 1

$$\frac{4!}{2!\,2!} = \frac{24}{2 \times 2} = 6$$



$1 = P(A \cap !B) + P(!A \cap B) + \ldots B)$

$P(A \cap B) = 1 - 2\,P(A \cap !B)$

$1 = 3\,P(A \cap !B \cap !C) + 3\,P(A \cap B \cap !C) + P(A \cap B \cap C)$

$P(A \cap B \cap C) = 1 - 3\underbrace{P(A \cap !B \cap !C)}_{\frac{1}{3^N}} - 3\underbrace{P(A \cap B \cap !C)}_{\left(\frac{2}{3}\right)^N - 2\left(\frac{1}{3}\right)^N}$

$1 = 4\underbrace{P(A \cap !B \cap !C \cap !D)}_{\frac{1}{4^N}} + 6\underbrace{P(A \cap B \cap !C \cap !D)}_{\left(\frac{2}{4}\right)^N - 2\left(\frac{1}{4}\right)^N} + 4\,P(A \cap B \cap C \cap !D) + P(A \cap B \cap C \cap D)$

$\left(\frac{3}{4}\right)^N - 3\left[\left(\frac{2}{4}\right)^N - 2\left(\frac{1}{4}\right)^N\right] - 3\,\frac{1}{4^N}$

$= \left(\frac{1}{4^N}\right)[4 - 12 - 12 + 24] + \left(\frac{2}{4}\right)^N[6 - 12] + \left(\frac{3}{4}\right)^N 4$

$= 4\left(\frac{1}{4}\right)^N - 6\left(\frac{2}{4}\right)^N + 4\left(\frac{3}{4}\right)^N$

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