1) 10 hus, 3 av dem har problem

$f = 3 \quad n = 10 \quad \boxed{\frac{3}{10}}$ reldtiv frekvens

$p = .3$

$A_1 \quad A_2$

$P[x_1 = s, \text{ och } x_2 = s]$

2) $p = .5$ två söner födda

$P[A_1 \cap A_2] =$

$P[A_1]P[A_2]$

omm oberoende

Alla möjligheter $S = \{ ff, \underline{ss}, fs, sf \}$

$n(A) = 1 \quad \frac{1}{4} = .25$ klassiska

$n(S) = 4$

not: X = antalet barn m. hemofili

hur många på två försök

$\text{Binom}(n=2, p=.5) \quad P[X=2] = f(2) = \binom{2}{2} 0.5^2 (0.5)^0$

$= 0.5^2 = 0.25$

3) $9! = 9\cdot 8\cdot 7\cdot 6\cdot 5\cdot 4\cdot 3\cdot 2\cdot 1 = 362\,880$

$6! = 6\cdot 5\cdot 4\cdot 3\cdot 2\cdot 1 = 720$

$$_7P_3 = \frac{7!}{(7-3)!} = \frac{7!}{4!} = 7\cdot 6\cdot 5 = 210$$

$$_6P_2 = \frac{6!}{6-2!} = 6\cdot 5 = 30$$

$$_5P_5 = \frac{5!}{(5-5)!} = \frac{5!}{0!} = 5! = 120$$

$$_6P_6 = \frac{6!}{(6-6)!} = 6! = 720$$

$$_9C_4 = \frac{9!}{4!(9-4)!} = \frac{9!}{4!5!} = \frac{9\cdot\cancel{8}\cdot 7\cdot\cancel{6}}{\cancel{4}\cdot\cancel{3}\cdot\cancel{2}} = 9\cdot 2\cdot 7 = 126$$

$$_8C_3 = \frac{8!}{3!\,(8-3)!} = \frac{8 \cdot 7 \cdot \cancel{6}}{\cancel{3 \cdot 2}} = 56$$

$$\binom{8}{5} = {}_8C_5 = \frac{8!}{5!\,3!} = \frac{8 \cdot 7 \cdot 6}{3 \cdot 2} = 56 \qquad \binom{8}{5} = \binom{8}{3} = 56$$

$$\binom{8}{0} = 1, \quad \binom{8}{8} = 1$$

$$\binom{8}{7} = 8 = \binom{8}{1}$$

4)

Programmers: $\binom{10}{3}$

S4s : $\binom{8}{2}$

ce $\binom{4}{2}$

stat $\binom{3}{1}$

a) $\binom{10}{3}\binom{8}{2}\binom{4}{2}\binom{3}{1} = 60480$

b) $\binom{10}{3}\binom{8}{2}\binom{3}{1}\binom{3}{1} = 30240$

3) Alphabet has 26 letters (for this example)
There are 10 digits.

a) $26^5 \cdot 10 = \underline{118\,813\,760}$

b) $\binom{5}{3} = \frac{5!}{3!\,2!} = \frac{5 \cdot 4}{2} = 10$

5 even digits: $10 \cdot 5 = \underline{50 \text{ passwords!}}$

c) $\boxed{1/50}$