

Department of Mathematics
MTL 601 (Probability and Statistics)
Tutorial Sheet 1
Answers to selected problems

2. $\Omega = \{DD, NDD, NDND, NNDD, NNDN, NNNN, NNND, NDNN, DNNN, DNDN, DNND, DNDD\}$.
5. 0.3.
6. 1.
26. $\frac{(n-k+1)!}{n!}$.
28. $2p^3(1-p)^4 + 3p^2(1-p)^5 + 3p^5(1-p)^2 + 2p^4(1-p)^3$.
30. (a) $\frac{43}{216}$, (a) $\frac{173}{216}$.
31. $1 - [(0.5)^n + (0.8)^n - (0.3)^n]$.
32. $\frac{1}{4}$.
33. $\sum_{k=n+1}^{2n} {}^n C_k \left(\frac{1}{2}\right)^k \left(\frac{1}{2}\right)^{2n-k}$.
34. $\frac{1-p}{2-p}$.
35. $1 - [1 - (0.5)^5]^{10} \approx 0.27$.
37. $\frac{0.35}{0.85}, \frac{0.3}{0.85}, \frac{0.2}{0.85}$.
38. $\frac{2}{45}$.
39. $x = 9$.
40. $\frac{3}{5}$.
42. $\frac{2}{5}$.
43. 0.93 .
44. $\frac{61}{140}$.
45. 0.6178, 0.0519.
46. $\frac{2}{7}$.
48. $\frac{1}{2}$.
54. $\frac{2}{9}$.
60. Required probability = $1 - \frac{365 \times 364 \times 363 \times \dots \times (365-n+1)}{365^n}$.
61. Required probability = $\frac{\binom{n+k-r}{n-r}}{\binom{n+k}{n}}$.
64. $\frac{3}{4}$ for both with and without replacement.
66. Required probability = $1 - \left(\int_{t_0}^{\infty} \frac{1}{\lambda} e^{-x/\lambda} dx\right)^5$.