

PHYS10471: Bottom-line answers, 2005/06

1. (a) $\frac{1}{6}$
(b) 0.607
(c) 0.158
(d) 0.181
2. (a) (ii) e.g., $P(E) = P(E|X)P(X) + P(E|\overline{X})P(\overline{X})$
(b) (ii) 66.0%, (iii) 0.103% (too precise, but it should help you check your answer)
3. (b) $P(t) = e^{-0.25 t^2}$
(c) $f(t) = 0.5 t e^{-0.25 t^2}$
(d) [most likely time of failure] = 1.41 yr
(e) [mean time of failure] = $\int_0^\infty t f(t) dt = 1.77$ yr
4. (a) $\frac{(\alpha t)^a}{a!} e^{-\alpha t}$
(c) $P_{a,c}(t; \alpha, \gamma) = \frac{(\alpha t)^a}{a!} \frac{(\gamma t)^c}{c!} e^{-(\alpha+\gamma)t}$
(d) $\frac{[(\alpha + \gamma)t]^n}{n!} e^{-(\alpha+\gamma)t}$