1. D **95%** See definition of the Empirical Rule.	2. E **4/15** for indep. events: P(A)P(B) = P(A∩B) = $P(A\mid B)P(B\mid A)$	3. A **8!/3!** 8 letters total 3 A's	4. A **3/2** $\int_0^1 f(t)dt = 1$ $\left[Ct^3/3 + t^2/2\right]_{t=0}^{t=1}$ $= 1 \Rightarrow C$	5. D **6** $\int_0^1\int_0^y k(1-y)dxdy = 1$ $\Rightarrow \int_0^1 ky(1-y)dy = 1$ $\Rightarrow k/6 = 1$
6. C **8/125** solve for *k*. $\int_0^5 kx^2dx = 1$ ➔ $k = 3/125$ $P(x \le 2) = \int_0^2 kx^2dx$	7. A **Gauss** The normal distribution, a.k.a. Gaussian distribution.	8. A **$(2RT/M)^{1/2}$** $P = Kv^2 \exp\left(\frac{-Mv^2}{RT}\right)$ $\frac{dP}{dv} = 0$ $0 = v^2\left(\frac{-Mv}{RT}\right) + 2v$ Solve for *v*.	9. D **12,600** $\binom{10}{4}\binom{6}{3}\binom{3}{2}\binom{1}{1}$ =12,600, where $\binom{n}{r} = \frac{n!}{r!(n-r)!}$	10. C **10/243** possible outcomes $3^5 = 243$. successes $\binom{5}{3}\binom{2}{2}\binom{0}{0} = 10$.
11. C **5/12** P(A / B > 1) = (1/2)(1-1/6) = 5/12	12. C **1/4** P(success)… B1: (1/4)(4/5)(3/4) B2: (1/4)(3/5)(2/4) B3: (1/4)(2/5)(1/4) B4: (1/4)(1/5)(0/4) ∑ = 1/4	13. D **5/48** P(Gill first to win in a round) = 1/12 P(everyone loses) = 1/5 P(Gill) = (1/12)/(1 – 1/5)	14. D **91/100** $1 - 0.3^2 = 1 - 0.09$ = 0.91	15. B **5/32** $P(4) = \frac{\binom{5}{4}}{2^5} = 5/32$
16. B **1/3** $\binom{5}{4}p^4(1-p) = \frac{10}{243}$ $p = 1/3$	17. E **840** $({}_7P_4) = 7!/3!$	18. C **5/16** M = (6)(1/2) = 3 $P(3) = ({}_6C_3)(1/2)^6$ $= 20/2^6$	19. E **1** $\int_{-\infty}^{\infty} xf(x)dx$ $= \int_0^{\infty} xe^{-x}dx$ $= 1$	20. C Note: *F*(*x*) = *f* ' (*x*) $F(-\infty) = 0$ $F(\infty) = 1$ *F* is non-decreasing.
21. C **$5!^4 / 10!12^2$** p(3)=$\frac{\binom{5}{3}\binom{5}{2}}{\binom{10}{5}}$ ≈0.397	22. B **0.6** $P(\overline{A} \cap \overline{B})$ $= 1 - P(A \cup B)$ $= 1 - P(A) - P(B)$ $+ P(A \cap B)$ =1 - 0.2 - 0.3 + 0.1	23. A **99/200** P(X/Y>1) = (1/2)(1-1/100)	24. B **j** Sum of the vector components equals unity.	25. C **1/2** E = 10/6 – (10*4/6 – 2)/4 + 0/6
26. B **sum less than 5; at least one 4** No overlap in these sets. Thus, mutually exclusive	27. B **24/625** $\frac{5}{5}\frac{4}{5}\frac{3}{5}\frac{2}{5}\frac{1}{5} = \frac{4!}{5^4}$	28. E **8/25** $(0.5)(6+2)^2/10^2$	29. C **9/14** P(at least one orange) =1 – P(all blue) $= 1 - \frac{\binom{6}{3}}{\binom{8}{3}} = 1 - \frac{20}{56}$	30. B **1/5** one correct answer out of five equally likely choices.