

1. (a) negative binomial,  $P(X = 4) = b^*(4; 2, 0.52) = 0.1869$   
 (b) binomial,  $P(X \leq 1) = B(1; 4, 0.52) = 0.2831$  OR  
 negative binomial,  $1 - P(X \leq 4) = 1 - B^*(4; 2, 0.52) = 0.2831$
2. binomial,  $P(X \geq 2) = 1 - B(1; 3, 0.52) = 0.5300$
3. Poisson,  $P(X = 2) = p(2; (3)(\frac{1}{2})) = p(2; (\frac{3}{12})(6)) = 0.2510$
4. Poisson,  $p(125; (13)(9)) = 0.0273$
5. (a) hypergeometric,  $P(X = 1) = h(1; 10, 4, 50) = 0.4290$   
 (b) hypergeometric,  $P(X \geq 2) = 1 - H(1; 10, 4, 50) = 0.1742$
6. (a) negative binomial,  $P(X = 8) = b^*(8; 5, 0.78) = 0.1076$   
 (b) negative binomial,  $P(10 \leq X \leq 15) = B^*(15; 7, 0.78) - B^*(9; 7, 0.78) = 0.3142$
7. (a) five seconds  
 (b) exponential,  $P(4 \leq X \leq 7) = F(7) - F(3) = 0.3022$   
 (c) Poisson,  $P(X \leq 19) = P(19; (12)(2)) = 0.1803$
8. (a) hypergeometric,  $P(X = 1) = h(1; 5, 6, 300) = 0.0934$   
 (b) hypergeometric,  $P(X \geq 1) = 1 - H(0; 5, 6, 300) = 0.0967$
9. (a) binomial,  $P(X = 10) = b(5; 10, \frac{22}{52}) = 0.2183$   
 (b) binomial,  $P(30 \leq X \leq 60) = B^*(60; 100, \frac{22}{52}) - B^*(29; 100, \frac{22}{52}) = 0.9957$   
 (c) negative binomial,  $P(X = 7) = b^*(7; 3, \frac{22}{52}) = 0.1258$
10. normal,  $P(0.05 \leq X \leq 0.07) = N(0.07; 0.0608, 0.0047) - N(0.05; 0.0608, 0.0047) = 0.9641$
11.  $P(0.05 \leq X \leq 0.07) = N(1.95; 0, 1) - N(-2.30; 0, 1) = 0.9637$
12. (a) exponential,  $P(X \geq 15) = 1 - F(15) = 0.4346$  OR  
 Poisson,  $P(X = 0) = p(0; (\frac{1}{18})(15)) = 0.4346$   
 (b) exponential,  $P(30 \leq X \leq 50) = F(50) - F(30) = 0.1851$
13. (a) negative binomial,  $P(X \geq 12) = 1 - B^*(11; 10, 0.78) = 0.7333$   
 (b) binomial,  $P(X = 3) = b(3; 5, 0.7333) = 0.2805$   
 (c) binomial,  $P(1 \leq X \leq 2) = b(1; 5, 1 - 0.7333) + b(2; 5, 1 - 0.7333)$   
 $= B(2; 5, 1 - 0.7333) - B(0; 5, 1 - 0.7333) = 0.6661$
14. (a) normal,  $P(X \geq 0.055) = 1 - N(0.055; 0.0608, 0.0047) = 0.8914$   
 (b) negative binomial,  $P(X \geq 21) = 1 - B^*(20; 0, 1 - 0.9641) = 0.4813$
15. (a) Poisson,  $P(X \geq 4) = 1 - P(3; (0.037)(30)) = 0.0265$   
 (b)  $(30)(0.037) = 1.11$  flaws
16. Poisson,  $P(X \leq 175) = P(175; (23)(8)) = 0.2679$