

Stat 345 Answers to the Practice Problems for the Final Exam

1. False, False, True, False, False
2. (a) (a) Not covered for exam.  
(b) (b)  $X = \text{No. of Defectives}$ .  $X \sim \text{Bin}(20, p = 0.35)$ ,  $P(X < 10) = 0.8782$ .
3. (a)  $c = 1/6$ .  
(b) 0.7917  
(c) 1.4  
(d) 0.26  
(e)  $F(x) = 0$ , if  $x < 0$ .  $F(x) = (1/6)(x^4/4 + x)$ , if  $0 \leq x \leq 2$ .  $F(x) = 1$ ,  $x > 2$ .  
(f)  $E(Y) = 0.8$  and  $\text{Var}(Y) = 2.34$ .
4. (a)  $P(X < 1) = 0.1587$ .  
(b)  $x^* = 1.456$
5. (a)  $E(\bar{X}) = 1.0$ .  
(b)  $\text{Var}(\bar{X}) = \sigma^2/n = 1/70 = 0.0143$ .  
(c)  $\bar{X}$  is approximately a  $N(1, 0.0143)$ .  
(d) 0.4525
6. (a)  $23.56 \pm 1.96 \frac{12.52}{\sqrt{50}} = (20.09, 27.03)$   
(b) With 95% confidence the mean number of can openers sold by ALL the stores in the region is between 20.09 and 27.03.
7. (a)  $X \sim \text{Bin}(n = 300, p = 0.21)$   
(b) Not covered for test.  
(c)  $X$  approx. a  $N(63, 49.77)$ . The probability is 0.0446.
8. (a)  $f(x) = 1/6$  for  $x = 1, 2, 3, 4, 5, 6$   
(b)  $E(X) = 3.5$ ,  $\text{Var}(X) = 2.9167$   
(c)  $P(Y > 3) = 0.8238$