Math 365 Exam 2 Review Problem Answers

1. (a) i. Uniform (discrete)
   ii. $\mu = 3; \sigma^2 = 2$

   (b) i. Geometric
   ii. $\mu = 10; \sigma^2 = 90$

   (c) i. Normal
   ii. $\mu = 50; \sigma^2 = 1600$

2. (a) $M(t) = e^{-t(1-t)}$

   (b) $\mu = 0$ (Hint: integrate by parts)

   (c) $\sigma^2 = 1$

   (d) $F(x) = 1 - e^{-x}$

   (e) $P(X \leq 2) = 0.95$

   (f) $\pi_{25} = -0.7123$

3. (a) 0.1093

   (b) 0.6375

   (c) 0.9500

4. (a) 45

   (b) 0.224 (Poisson $\lambda = 7.5$)

   (c) 0.713 (Exponential $\theta = 4$)

   (d) 0.544 (Gamma $\theta = 4; \alpha = 3$)

5. OOPS - This is from a section we didn’t cover yet. Don’t worry about this one.

6. $c = \frac{3}{2}$

7. $\mu = 2$

8. $a = 2.733$

9. $0.083$

10. (a) 96

    (b) $e^{-8/5} = 0.202$ (Exponential $\theta = 5$)

    (c) 0.323 (Gamma $\theta = 5; \alpha = 3$)

    (d) 0.228 (Poisson $\lambda = 12$)

    (e) 0.182 ($X \sim b(8, 0.228)$)

11. (a) $f_1(y) = 4y^3$

    (b) $\mu_Y = 4/5$

    (c) $\mu_Y = 4/5$

    (d) $P(X < 1/2) = 0.4375$

    (e) $P(Y > 1/2) = 15/16 = 0.9375$

    (f) $P(x \leq 1/4; Y \geq 3/4) = 7/128 = 0.0547$

    (g) Dependent (non-rectangular support)

12. 1 ($X \sim b(5, 0.202)$)

13. The problem on the worksheet used undesirable numbers. I’ve updated it. The answer to the question as now written is 0.048 (Note: $X \sim b(20, 0.3)$)