Math/Stat 54 HW#10 April 2, 2001

§4.3 #1 X = waiting time until $\alpha = 10^{\text{th}}$ change with $\theta = \frac{1}{(2/3)} = \frac{3}{2}$.

so

(a) pdf of X is a gamma distribution: $\alpha = 10$, $\theta = 3/2$.

$$f(x) = \frac{1}{\Gamma(10)(3/2)^{10}} x^9 e^{-2x/3}, \quad 0 \le x$$

(b) From bottom of page 187 of text, where we derived $\mu = \alpha\theta = 15$, $\sigma^2 = \alpha\theta^2 = 45/2$

#9 (a) X is $\chi^2(17)$, then $r = 17 \Rightarrow$

$P(X < 7.564) = .024997$

(c) $P(6.408 < X < 27.59) = .940035$

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§4.4 #1 Z is standard normal

(a) $P(.53 < Z \le 2.06) = \Phi(2.06) - \Phi(.53) = .2784$

(b) $P(-.79 \le Z < 1.52) = \Phi(1.52) - \Phi(-.79) = \Phi(1.52) + \Phi(.79) - 1$ (symmetry)

$= .72098$ (symmetry)

(c) $P(Z > -1.77) = P(Z < +1.77) = .96164$

(d) $P(Z > 2.89) = 1 - P(Z < 2.89) = .001926$

(f) $P(|Z| < 1) = P(-1 < Z < 1) = 2\Phi(1) - 1 = .682689$ (symmetry)