Stat 345 Solutions - Section 4.7 (3^{rd} ed)

Problem 4-61

(a) $P(X \leq 70) = P(Z \leq \frac{70-80}{\sqrt{48}}) = P(Z \leq -1.44) = 0.0749$

(b) $P(70 < X < 90) = P(\frac{70-80}{\sqrt{48}} < Z < \frac{90-80}{\sqrt{48}}) = P(-1.44 < Z < 1.44) = P(Z < 1.44) - P(Z < -1.44) = 0.9251 - 0.0749 = 0.8502$

Problem 4-66

X equals the number of particles in 10 square centimeters of dust. X follows a Poisson distribution with $\lambda = (1000)(10) = 10000$.

$P(X > 10000) = 1 - P(X \leq 10000) = 1 - P(Z \leq \frac{10000-10000}{\sqrt{10000}}) = 1 - P(Z \leq 0) = 1 - 0.5 = 0.5$