Online Problem 1 $X \sim N(12.1, 0.2)$ Rob HW5 ①

(a) $P(X < 12) = P\left(Z < \frac{12 - 12.1}{0.2}\right) = P(Z < -0.5) = P(Z > 0.5) = \boxed{0.309}$

(b) Y = 7 sodas

$n = 7 \quad p = 0.309$

$E(Y) = np = 7(0.309) = \boxed{2.163}$

$V(Y) = np(1-p) = 7(0.309)[1-0.309] = 1.4946$

$SD(Y) = \sqrt{1.4946} = \boxed{1.2225}$

(c) $P(Y \leq 3) = P(0) + P(1) + P(2) + P(3)$

$= \binom{7}{0}(0.309)^0(0.691)^7 + \binom{7}{1}(0.309)^1(0.691)^6 +$

$\binom{7}{2}(0.309)^2(0.691)^5 + \binom{7}{3}(0.309)^3(0.691)^4$

$=$

(d) $\text{Profit} = 1 - 0.06X$

$E(\text{Profit}) = 1 - 0.06\,E(X) = 1 - 0.06(12.1) = \boxed{0.274}$