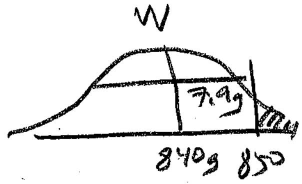
2013Q3

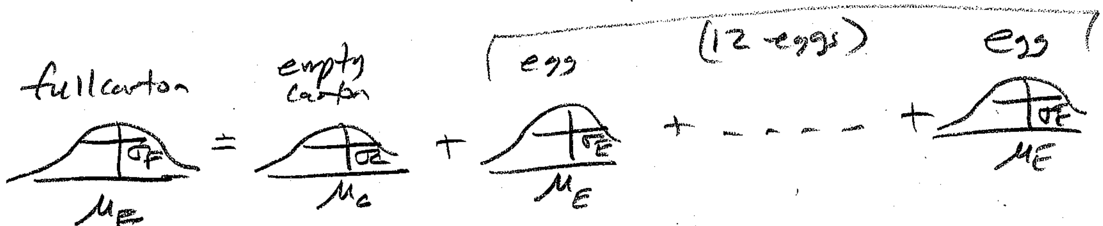
(a)



$P(W \geq 850) = \text{normalcdf}(850, 9999, 840, 7.9)$ (lower, upper, mean, SD)

$= \boxed{.1028}$

(b)



Algebra: $F = C + \underbrace{E + E + E + E - - - - + E}_{12 \text{ eggs}}$

means follow algebra: $\mu_F = \mu_c + \underbrace{\mu_E + \mu_E + \mu_E - - - - + \mu_E}_{12 \text{ eggs}}$

$\mu_F = \mu_c + 12\mu_E$

variances add: $\sigma_F^2 = \sigma_c^2 + \underbrace{\sigma_E^2 + \sigma_E^2 + \sigma_E^2 + \dots + \sigma_E^2}_{12 \text{ eggs}}$

$\sigma_F^2 = \sigma_c^2 + 12\sigma_E^2$

problem says: $\mu_F = 840g$ $\sigma_F = 7.9g$

$\mu_c = 20g$ $\sigma_c = 1.7g$

we want to know $\mu_E = ?$ $\sigma_E = ?$ ← they define random variable X for 1 egg

so μ_X σ_X

(i) mean:

$\mu_F = \mu_c + 12\mu_X$

$840 = 20 + 12\mu_X$

$12\mu_X = 820$

$\mu_X = \frac{820}{12} = \boxed{68.3333g}$

(ii) SD:

$\sigma_F^2 = \sigma_c^2 + 12\sigma_X^2$

$(7.9)^2 = (1.7)^2 + 12\sigma_X^2$

$12\sigma_X^2 = (7.9)^2 - (1.7)^2$

$\sigma_X^2 = \frac{(7.9)^2 - (1.7)^2}{12}$

$\sigma_X = \sqrt{\frac{(7.9)^2 - (1.7)^2}{12}} = \boxed{2.2271g}$