6-20

(a) $9.5 \Rightarrow 9.55$

$$Z = \frac{9.55-8}{0.9} = 1.72$$

$P(Z > 1.72) = 1 - 0.9573 = 0.0427$ ※

(b)

$$Z = \frac{8.65-8}{0.9} = 0.72$$

$P(Z < 0.72) = 0.7642$ ※

(c)

$$Z_1 = \frac{9.15-8}{0.9} = 1.28 \quad , \quad Z_2 = \frac{7.25-8}{0.9} = -0.83$$

$P(Z<1.28) - P(Z<-0.83) = 0.8997 - 0.2033 = 0.6964$ ※

6-28

$\mu = 100 \times 0.72 = 72$ , $\sigma = 4.489$

(a)

$$Z = \frac{80.5-72}{4.489} = 1.894$$

$P(Z > 1.894) = 1 - 0.9706 = 0.0294$ ※

(b)

$$Z = \frac{67.5-72}{4.489} = -1.002$$

$P(Z < -1.002) = 0.1539$

6.58

$\beta = \frac{1}{3}$, $\alpha = 10$

(a) $P(X \geq 10) = 1 - P(X < 10) = 1 - 0.9863 = 0.0137$ ※

(b) $P(X \leq 2) = \int_0^2 \frac{1}{\beta^\alpha} \frac{x^{\alpha-1} e^{-\frac{x}{\beta}}}{\Gamma(\alpha)} dx$

let $z = \frac{x}{\beta}$, $dz = \frac{1}{\beta} dx$

$P(X \leq 2) = P(Y \leq 10) = \int_0^{10} \frac{y^{\alpha-1} e^{-y}}{\Gamma(\alpha)} dy = F(10;10) = 0.542$

$P(X > 2) = 1 - P(X \leq 2) = 1 - 0.542 = 0.458$ ※