8.2) b) $\mu = 15 \quad \sigma \approx 4.824$ (?)

$$P(10 \leq X \leq 20) \overset{!}{=} 0.7$$

$$P\Big(\underbrace{\frac{10-15}{\sigma}}_{y_{30}} \leq \underbrace{X}_{y} \leq \underbrace{\frac{20-15}{\sigma}}_{y_{70}}\Big) \overset{!}{=} 0.7$$

$$y_{70} - y_{30} = 0.7$$

$$N\left(\frac{5}{\sigma}\right) - 1 - N\left(\frac{5}{\sigma}\right) \overset{!}{=} 0.7$$

$$2N\left(\frac{5}{\sigma}\right) \overset{!}{=} 1.7$$

$$N\left(\frac{5}{\sigma}\right) \overset{!}{=} 0.85$$

$$N(1.04) = 0.8508$$

$$\hookrightarrow \frac{5}{\sigma} = 1.04 \Rightarrow \underline{\sigma = 4.8077}$$

a) $\mu = 30 \quad \sigma = 4$

$$P(X \leq 34.32) = N\left(\frac{34.32-30}{4}\right) = 0.8599 = 85.99\%$$

8.3) a) $\sigma^2 = 72.43 \quad \sigma = 8.511$

$P(X > 166) = 0.95 \Rightarrow P(X \leq 166) = 0.05$

~~[illegible]~~

$$F(x) = \frac{1}{\sigma\sqrt{2\pi}} \int_{-\infty}^{x} e^{-\frac{(t-\mu)^2}{2\sigma^2}} dt$$

A

B

$$\frac{F(x)}{A} = 1.066896 = \int_{0}^{166} e^{-\frac{(t-\mu)^2}{B}} dt$$

⋮

8.4) a) $L(\lambda) = f(x_1;\lambda) \cdot f(x_2;\lambda) \cdot \ldots \cdot f(x_n;\lambda)$

$$= \underbrace{\lambda e^{-\lambda x_1}}_{\text{falls } x \geq 0} \cdot \lambda e^{-\lambda x_2} \cdot \ldots \cdot \lambda e^{-\lambda x_n}$$

log

$$\log L(\lambda) = \frac{\lambda^n}{e^{\sum_{i=1}(\lambda x_i)}}$$

b) $\log L(\lambda) = \dfrac{\lambda^n}{e^{\sum_{i=1}(\lambda x_i)}}$

$$\log_{\lambda} L(\lambda) = \lambda^{n-1} \cdot e^{-\sum_{i=1}^{n}(\lambda x_i)} \cdot \left(n - \lambda \cdot \sum_{i=1}^{n} x_i\right) \stackrel{!}{=} 0$$

$$\log L(\lambda) = n \ln(\lambda) - \lambda \sum_{i=1}^{n} x_i$$