$1(z-a)^{1}+(2z-2a)z$ $\quad 5z^4-4z^3$ $\quad az^2$ $\quad 5z^4[(z-a)+(2)z]z$ $\quad -\frac{t^2}{2}+\mu t-\frac{\mu^2}{2}+t$ $\quad \frac{1(1-(\frac{1}{z})^5)}{1-\frac{1}{z}}$ $\quad \frac{z-z^{-4}}{(z-1)}$ $\quad e^{\mu}$

17\. (1) $U=\frac{\bar{X}-\mu}{\sigma/\sqrt{n}}\sim N(0,1)$

$\bar{X}-\frac{\sigma}{\sqrt{n}}u_{0.025}=4.2693$

$\bar{X}+\frac{\sigma}{\sqrt{n}}u_{0.025}=4.4587$

$(4.2693,\ 4.4587)$

(2) $T=\frac{\bar{X}-\mu}{S/\sqrt{n}}\sim t(4)$

$\bar{X}-\frac{S}{\sqrt{n}}t_{0.025}(4)=4.2968$

$\bar{X}+\frac{S}{\sqrt{n}}t_{0.025}(4)=4.4312$

$(4.2968,\ 4.4312)$

19\. (1) $f(\ln X)=\frac{1}{\sqrt{2\pi}}e^{-\frac{(\ln X-\mu)^2}{2}}$，令 $\ln X=t$

则 $E(X)=E(e^t)=\int_{-\infty}^{\infty}e^t\cdot\frac{1}{\sqrt{2\pi}}\cdot e^{-\frac{(t-\mu)^2}{2}}\cancel{dt}\ e^{\mu+\frac{1}{2}}$

(2) $\overline{\ln X}=\frac{1}{4}(\ln 0.5+\ln 1.25+\ln 0.8+\ln 2)=0$

$\frac{\sigma}{\sqrt{4}}\cdot u_{0.025}=0.98$

$\therefore(-0.98.\ 0.98)$

(3) $E(X)=e^{\mu+\frac{1}{2}}$ $\quad\therefore(e^{-0.48},\ e^{1.48})$

20\. 区间长度：$2\frac{\sigma}{\sqrt{n}}u_{\frac{\alpha}{2}}\le l$

$n\ge\frac{4\sigma^2}{l^2}\cdot u_{\frac{\alpha}{2}}^2$

补：$f(x)=\begin{cases}\frac{3}{8\theta}, & \frac{\theta}{3}<x<\theta\\ 0, & 其他\end{cases}$，$F(x)=\begin{cases}\frac{1}{\frac{8}{3}\theta}\cdot(x-\frac{\theta}{3}), & x\in[\frac{\theta}{3},3\theta)\\ 0, & x<\frac{\theta}{3}\\ 1, & x\ge 3\theta\end{cases}$

$\cancel{F_{X(n)}(x)=F(x)^n\cdot\ f_{X(n)}(x)=F(x)^{n-1}\cdot n=\frac{n(x-\frac{\theta}{3})^{n-1}}{(\frac{8}{3}\theta)^{n-1}}}$

$\cancel{E(X_{(n)})\int_{\frac{\theta}{3}}^{3\theta}x\cdot\frac{n(x-\frac{\theta}{3})^{n-1}}{(\frac{8}{3}\theta)^{n-1}}dx=\frac{n}{n+1}\cdot 3\theta+\frac{1}{n+1}\cdot\frac{1}{3}\theta}$

$\cancel{\theta=\frac{n+1}{3n+\frac{1}{3}}E(X_{(n)})}$ $\quad$ 是 $1-(\frac{5}{8})^n$ 的置信区间

$P(\frac{1}{3}X_{(n)}<\theta)=P(X_{(n)}<3\theta)=F_{X(n)}(3\theta)=\left(\frac{(3\theta-\frac{\theta}{3})}{\frac{8}{3}\theta}\right)^n=1$

$P(\frac{1}{2}X_{(n)}<\theta)=P(X_{(n)}<2\theta)=F_{X(n)}(2\theta)=\left(\frac{2\theta-\frac{\theta}{3}}{\frac{8}{3}\theta}\right)^n=\left(\frac{5}{8}\right)^n$

$\therefore P(\frac{1}{3}X_{(n)}<\theta<\frac{1}{2}X_{(n)})=1-P(\frac{1}{3}X_{(n)}>\theta)-P(\frac{1}{2}X_{(n)}<\theta)=1-(\frac{5}{8})^n$