6. 1) a) $\Sigma x_i = 219.8$

$n = 27$

$\bar{x} = \frac{219.8}{27}$

$= 8.1407$

so the mean is 8.1407

b) the point equals to median

median observation $\frac{27+1}{2} = 14$

Ans = 7.7

B+

c) $\Sigma x_i^2 = 1860.94 \quad \Sigma x_i = 219.8$

$$\sigma = \sqrt{\frac{\Sigma x^2 - \frac{(\Sigma x)^2}{n}}{n-1}}$$

$$\sigma = \sqrt{\frac{(1860.94)^2 - \frac{(219.8)^2}{n}}{27-1}}$$

$\sigma = 1.6595$

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8. a) proportion $= \frac{80-12}{80} = \frac{68}{80} = 0.85$

b) proportion of the system $= \frac{80-12}{80} \times \frac{80-12}{80} = 0.7225$

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9. a) $E(\hat{\mu}) = E(\bar{x}) = E\left(\frac{1}{n}\sum_{i=1}^{n} x_i\right) = \frac{1}{150}(0(18) + 1(37) + 2(42)$
$+ 3(30) + 4(13) + 5(7) + 6(2) + 7(1)) = 2.1133$.

b) $\sigma = \sqrt{V(\bar{x})} = \sqrt{\frac{\hat{\mu}}{n}} = \sqrt{\frac{2.1133}{150}}$

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13. $E(X) = \int_{-\alpha}^{\alpha} x f(x)\, dx$

$$= \int_{-1}^{1} x \cdot 0.5(1+\theta x)\, dx$$

$$= \frac{1}{2}\left(\frac{x^2}{2} + \theta\frac{x^3}{3}\right)\Big|_{-1}^{1}$$

$$= \frac{1}{2} \cdot \left[\left(\frac{1^2}{2} + \frac{\theta \cdot 1^3}{3}\right) - \left(\frac{(-1)^2}{2} + \frac{\theta(-1)^3}{3}\right)\right]$$

$$= \frac{\theta}{3}$$

$E(3X) = \theta$.

a) $\hat{p} = \frac{x}{n} = 0.15$

b) $E(\hat{p}) = E\left(\frac{x}{n}\right) = \frac{1}{n} E(x) = p$

c) $(1-p)^3 = (1-0.15)^3 = 0.4437.$

27、 a) $E(x^2) = V(x) + E(x)^2$

$= \beta^2 \cdot \Gamma\left(1+\frac{2}{a}\right)$

$\bar{x} = \beta\left(\Gamma\left(1+\frac{1}{a}\right)\right)$

$\beta = \frac{\bar{x}}{\Gamma\left(1+\frac{1}{a}\right)}$

$$\frac{\frac{1}{n}\sum_{i=1}^{n} x_i^2}{\bar{x}^2} = \frac{\beta^2 \Gamma\left(1+\frac{2}{a}\right)}{\beta^2\left[\Gamma\left(1+\frac{1}{a}\right)\right]^2}$$

$$\frac{1}{n\bar{x}^2} \cdot \sum_{i=1}^{n} x^2 = \frac{\beta^2 \Gamma\left(1+\frac{2}{a}\right)}{\beta^2\left[\Gamma\left(1+\frac{1}{a}\right)\right]^2}$$

b) $1+\frac{1}{a} = 1.2 \quad a = 5$

$\beta = \frac{28}{1.2}$

29、 $L(x; \lambda, \theta) = \prod_{i=1}^{n} f(x, \lambda, \theta)$

$$\frac{\partial \ell(\lambda, \theta)}{\partial \lambda} = \frac{n}{\lambda} - \sum_{i=1}^{n} (x_i - \theta) = 0$$

$\hat{\lambda} = \frac{n}{\sum_{i=1}^{n}(x_i - \theta)}.$

b $\theta = \min(x) = 0.64 \qquad \sum_{i=1}^{10} (x_i - 0.64) = 49.4$

$\hat{\lambda} = \frac{10}{49.4} = 0.2028.$

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