

6.10

$$(1) \bar{x} - \bar{y} = 14.5 - 20.8 = -6.3$$

$$(2) 1 - \alpha = 0.98, \quad \frac{\alpha}{2} = 0.01, \quad z_{\frac{\alpha}{2}} = z_{0.01} = 2.327$$

$$\begin{aligned} (2) \quad & (\bar{x} - \bar{y}) \pm z_{\frac{\alpha}{2}} \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}} \\ & = (14.5 - 20.8) \pm 2.327 \sqrt{\frac{(3.5)^2}{250} + \frac{(3.8)^2}{180}} \\ & = (-6.3) \pm 0.84 \\ & = (-7.14, -5.46) \# \end{aligned}$$

6.11

$$n_1 = 12, \quad \bar{x} = 36, \quad s_1 = 5$$

$$n_2 = 15, \quad \bar{y} = 32, \quad s_2 = 7$$

$$(2) \quad 1 - \alpha = 0.9, \quad \frac{\alpha}{2} = 0.05, \quad t_{\frac{\alpha}{2}}(n_1 + n_2 - 2) = t_{0.05}(25) = 1.708$$

$$\begin{aligned} s_p^2 &= \frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2} = \frac{(12 - 1)5^2 + (15 - 1)7^2}{12 + 15 - 2} \\ &= \frac{961}{25} = 38.44 \end{aligned}$$

$$(\bar{x} - \bar{y}) \pm t_{\frac{\alpha}{2}}(n_1 + n_2 - 2) \sqrt{s_p^2 \left(\frac{1}{n_1} + \frac{1}{n_2} \right)}$$

$$= (36 - 32) \pm 1.708 \sqrt{38.44 \left(\frac{1}{12} + \frac{1}{15} \right)}$$

$$= 4 \pm 4.1$$

$$= (-0.1, 8.1) \#$$