Solution to HW Chapter 9

1. T
2. T
3. F
4. F
5. C
6. A
7. C
8. $H_0 : \mu = 7.5 \quad \text{VS} \quad H_a : \mu < 7.5$

   Test statistic $z = \dfrac{7.01 - 7.5}{3.74/\sqrt{100}} = -1.31.$
   p-value $= P(z < -1.31) = 0.0951 > 0.05 = \alpha.$

   Do not reject H_0. The assumption that $\mu = 7.5$ still holds true.
9. a) $H_0 : \mu = 100 \quad \text{VS} \quad H_a : \mu > 100$

   b) Test statistic $z = \dfrac{102 - 100}{10/\sqrt{25}} = 1.$
   c) the critical value is 1.645

   d) Decision: Do not reject H_0. The assumption that $\mu = 100$ still holds true.
10. Test statistic $z = \dfrac{0.26 - 0.2}{\sqrt{(0.2)(0.8)/100}} = 1.5.$

    p-value $= 2 \cdot P(z > 1.5) = 2(1 - 0.9332) = 0.1336.$
11. $H_0 : p \leq 0.88 \quad \text{VS} \quad H_a : p > 0.88$

    Test statistic $z = \dfrac{0.92 - 0.88}{\sqrt{(0.88)(0.12)/100}} = 1.2309.$

    The critical value is 2.33.

    Decision: Do not reject H_0. The assumption that $p \leq 0.88$ still holds true.