9-9 a) $\bar{x}$ =11.25, then p-value= $P\left(Z \le \frac{11.25-12}{0.5/\sqrt{4}}\right) = p(Z \le -3) = 0.00135$

b) $\bar{x}$ =11.0, then p-value= $P\left(Z \le \frac{11.0-12}{0.5/\sqrt{4}}\right) = p(Z \le -4) \le 0.000033$

c) $\bar{x}$ =11.75, then p-value= $P\left(Z \le \frac{11.75-12}{0.5/\sqrt{4}}\right) = p(Z \le -1) = 0.158655$

9-12 $\mu_0 - z_{\alpha/2}\left(\frac{\sigma}{\sqrt{n}}\right) \le \bar{X} \le \mu_0 + z_{\alpha/2}\left(\frac{\sigma}{\sqrt{n}}\right)$, where σ =2

a) α=0.01, n=9, then $z_{\alpha/2}$ =2,57, then 98.29,101.71

b) α=0.05, n=9, then $z_{\alpha/2}$ =1.96, then 98.69,101.31

c) α=0.01, n=5, then $z_{\alpha/2}$ =2.57, then 97.70,102.30

d) α=0.05, n=5, then $z_{\alpha/2}$ =1.96, then 98.25,101.75

9-26 $X \sim$ bin (10, 0.3) Implicitly, H_0: $p = 0.3$ and H_1: $p < 0.3$
$n = 10$
Accept region: $\hat{p} > 0.1$
Reject region: $\hat{p} \le 0.1$
Use the normal approximation for parts a), b) and c):

a) When p =0.3 α = $P(\hat{p} < 0.1) = P\left(Z \le \frac{0.1-0.3}{\sqrt{\frac{0.3(0.7)}{10}}}\right)$

$$= P(Z \le -1.38)$$
$$= 0.08379$$

b) When p = 0.2 β = $P(\hat{p} > 0.1) = P\left(Z > \frac{0.1-0.2}{\sqrt{\frac{0.2(0.8)}{10}}}\right)$

$$= P(Z > -0.79)$$
$$= 1 - P(Z < -0.79)$$
$$= 0.78524$$

c) Power = 1 – β = 1 – 078524 = 0.21476