Keys to Sample Final Exam in MA 180/418, Spring 2010

	Q1: \mathbf{d}	Q2: \mathbf{a}	Q3: \mathbf{d}	Q4: \mathbf{d}	Q5: \mathbf{d}
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Q6: c Q7: b Q8: a Q9: d Q10: a

Q11: $\mu = 2.83$ and $\sigma = 1.28$ (by calculator)

- Q12: (a) z = (140 115.1)/23.2 = 1.07 and P = 0.1423. (b) $z = (140 - 115.1)/(23.2/\sqrt{4}) = 2.15$ and P = 0.0158.
- Q13: (a) $\bar{x} = 98.25$. (b) $98.14 < \mu < 98.36$; the critical value is t = 1.660.
- Q14: $0.0447 < \sigma < 0.0599.$
- Q15: $H_0: p = 0.75$, $H_1: p \neq 0.75$; critical values: $z = \pm 2.33$; test statistic: z = 2.51; initial conclusion: reject H_0 ; final conclusion: reject the original claim; P-value= 0.012.
- Q16: $-27.99 < \mu_1 \mu_2 < -11.81$; the critical value is t = 1.664.
- Q17: $H_0: \mu_d = 0, \quad H_1: \mu_d \neq 0;$ critical values: $t = \pm 2.571;$ test statistic: t = -3.817; initial conclusion: reject $H_0;$ final conclusion: there is a difference; P-value is between 0.01 and 0.02 (by Table A-3) or 0.0124 (by calculator)
- Q18: $H_0: \sigma_1^2 = \sigma_2^2$, $H_1: \sigma_1^2 > \sigma_2^2$; critical value: F = 2.4034test statistic: F = 1.186; initial conclusion: accept H_0 ; final conclusion: reject the original claim.
- Q19: (a) r = 0.984; the critical value is 0.878. There is a linear correlation. (b) $\hat{y} = -30.44 + 1.52 x$; the predicted *y*-value is 121.56 (we use the regression equation, because there is a linear correlation).
- Q20: (a) $r^2 = 0.968$; (b) $s_e = 2.245$; (c) total= 477.2 (d) explained= 462.1; (e) unexplained= 15.1.