# SOLUTION INFORMATION FOR SAMPLE PROBLEMS FOR EXAM II

**MATH 526 Applied Math. Stat.**, 11/18

1. $\frac{5S^2}{4}$ is $\chi^2(5)$
2. $X+Y$ is $N(3,25)$
3. $P(X<c)=P(\frac{1}{X}>\frac{1}{c})=.05$
   (3,5) degrees of freedom for $\frac{1}{X}$ and use table for F distribution.
4. $P(|X-2|^2>.36)=P(X-2>.6)+P(X-2<-.6)$;
   $X-1$ is $N(0,4)$
5. $\frac{\frac{Y}{n}-p}{\sqrt{p((1-p)/n)}}$ is approximately $N(0,1)$
   Replace $\sqrt{(p(1-p)/n)}$ by $\sqrt{(\hat{p}(1-\hat{p})/n)}$ where $\hat{p}=\frac{Y}{n}$
6. $\frac{14S^2}{\sigma^2}$ satisfies a $\chi^2(14)$ distribution
7. $\frac{(n_2-1)\sigma_1^2S_2^2}{(n_1-1)\sigma_2^2S_1^2}$ satisfies an F(9,15) distribution
8. $\frac{X-\mu}{2/4}$ is $N(0,1)$
9. $\bar{X}$ is $N(4,4)$ Use N(0,1) table
10. $\bar{X}-\frac{z_{.025}}{\sqrt{n}}<\mu<\bar{X}+\frac{z_{.025}}{\sqrt{n}}$
11. Trinomial distribution with $\int_{\frac{1}{2}}^{1}2xdx=\frac{3}{4}=p_1;\int_0^{frac14}2xdx=\frac{1}{16}=p_2$
    Answer is $\frac{4!}{2!}p_1^2p_2(1-p_1-p_2)$