

ST521 Review Session 3, Fall 2009

1. Old homework 2.6
2. Old homework 2.9
3. Homework 2.22 (hint, using transformations)
4. Find the solution to  $\Gamma(\frac{1}{2})$ .

Answer:  $\sqrt{\pi}$ .

5.  $X \sim U(0,1)$ , find the density of  $Y = \sin(2\pi X)$ .

Answer:  $f(y) = \frac{1}{\pi} \frac{1}{\sqrt{1-y^2}}$ ,  $-1 < y < 1$ .

6. Review of integration by parts:

(a) Find  $\int x^2 \cos(x) dx$ .

(b) Find  $\int \exp^x \cos(x) dx$ .

(c) Find  $\int_0^\infty \exp^{-\frac{x}{2}} x^2 dx$ .