## Practice Problems for Test-3

1.(Integration by parts) Let X be a random variable with following density function

$$f(x) = \sin(2x), \ 0 \le x \le \pi/2.$$

Find the mean and variance of X.

2. Let (X, Y) has the joint density function

$$f(x,y) = k(x+y), \quad 0 \le x, y \le 2, x+y \ge 2.$$

(i) Find k. (ii) Find  $f_{X|Y}(x)$ . (iii) Find  $P(X \ge 1)$ . (iv) Find EY.