

**STAT 400 SUMMER II 2001 (PROFESSOR GREEN)
SOLUTIONS TO PROBLEMS DUE AUGUST 6**

22.

- (a) 14.1
- (b) 9.6

26. \$15.40

30.

- (a) -3.2025
- (b) -.20744

32. $E(XY) = E(X) = 1$. Because the integral defining $E(Y)$ diverges, it is not possible to define the covariance or correlation of X and Y .

34. The variance of any random value is just the expected value of its square minus the square of the expected value. In particular the expected value of the square is again just an expected value. For the maximum in Exercise 22, we already have that the expected value is 9.6. The expected value of the square of the maximum is 105.5, so the variance is 13.34.

36. $E(XY) = aE(X^2) + bE(X)$. $E(X)E(Y) = a(E(X))^2 + bE(X)$. It follows that $\text{Cov}(X, Y) = aV(X)$. Since $\sigma_Y = |a|\sigma_X$, it follows that $\text{Corr}(X, Y) = \frac{a}{|a|}$, which is 1 if a is positive and -1 if a is negative.