

**STAT 100 SUMMER II 2000 (PROFESSOR GREEN)
SOLUTIONS TO ASSIGNED PROBLEMS DUE JULY 31**

Problem 30. The mean is 2, the variance is .8 and the standard deviation is .8944.

Problem 32. The distribution is given by $f(\$50,000) = .000001$, $f(\$5,000) = .000004$, $f(\$100) = .0002$, and $f(\$20) = .002$, $f(0) = 1 - .002205 = .997795$. The expected winnings is $\$.05 + \$.02 + \$.02 + \$.04 = \$.13$, which is considerably less than the cost of the stamp you placed on the envelope.

Problem 34. The expected payment per policy is \$40.00, so that the expected profit per policy is \$10.00.

Problem 38. For each value x , $xf(x) = \frac{12}{25}$. Since x takes on exactly four values, the mean is $\frac{48}{25} = 1.92$. Similarly $x^2f(x) = \frac{12}{25}x$ so that $E(X^2) = \frac{120}{25} = 4.8$. It follows that $\sigma^2 = 1.1136$ and $\sigma = 1.0553$.

Problem 40.

- (a) When $x = 1$, $8 - 2x = 6$; when $x = 2$, $8 - 2x = 4$; when $x = 3$, $8 - 2x = 2$; when $x = 4$, $8 - 2x = 0$. It follows that the y values correspond to the values $8 - 2x$ in reverse order. Since the probabilities assigned to corresponding values are the same, it follows that the Y distribution is indeed the distribution of $8 - 2X$.
- (b) $\mu_X = 2.7$, $\sigma_X^2 = .81$, and $\sigma_X = .9$
- (c) $\mu_Y = 2.6$, $\sigma_Y^2 = 3.24$, and $\sigma_Y = 1.8$.

Problem 44.

- (a) The y histogram is more spread out than the x histogram.
- (b) Both distributions have mean equal to 2.
- (c) $\sigma_X = \sqrt{.4} = .6325$; $\sigma_Y = \sqrt{1.2} = 1.0954$. As expected, the more spread out distribution has the larger standard deviation.