

**HW 3-2 (Due Sep. 13, 2016)****Name:**

Print then work on it directly. Staple HW 3-1 and 3-2 together.

**Problem 1**

- 3.12** Let  $Y$  be a random variable with  $p(y)$  given in the accompanying table. Find  $E(Y)$ ,  $E(1/Y)$ ,  $E(Y^2 - 1)$ , and  $V(Y)$ .

$y$	1	2	3	4
$p(y)$	.4	.3	.2	.1

## Problem 2

- 3.14** The maximum patent life for a new drug is 17 years. Subtracting the length of time required by the FDA for testing and approval of the drug provides the actual patent life for the drug—that is, the length of time that the company has to recover research and development costs and to make a profit. The distribution of the lengths of actual patent lives for new drugs is given below:

Years, $y$	3	4	5	6	7	8	9	10	11	12	13
$p(y)$	.03	.05	.07	.10	.14	.20	.18	.12	.07	.03	.01

- Find the mean patent life for a new drug.
- Find the standard deviation of  $Y =$  the length of life of a randomly selected new drug.

### Problem 3

- 3.23** In a gambling game a person draws a single card from an ordinary 52-card playing deck. A person is paid \$15 for drawing a jack or a queen and \$5 for drawing a king or an ace. A person who draws any other card pays \$4. If a person plays this game, what is the expected gain?

#### Problem 4

- 3.27** A potential customer for an \$85,000 fire insurance policy possesses a home in an area that, according to experience, may sustain a total loss in a given year with probability of .001 and a 50% loss with probability .01. Ignoring all other partial losses, what premium should the insurance company charge for a yearly policy in order to break even on all \$85,000 policies in this area?

**Problem 5**

- 3.34** The manager of a stockroom in a factory has constructed the following probability distribution for the daily demand (number of times used) for a particular tool.

$y$	0	1	2
$p(y)$	.1	.5	.4

It costs the factory \$10 each time the tool is used. Find the mean and variance of the daily cost for use of the tool.