ASSIGNMENT #10
(due Friday, April 13)

PROBLEM 7.1-1 (3 pt)

*Hint:* Recall that

\[ \alpha = P(X \in C; H_0) = P(X = 2 \text{ or } X = 3) \text{ if } p = 1/3, \]

\[ \beta = P(X \notin C; H_1) = P(X = 0 \text{ or } X = 1) \text{ if } p = 2/3. \]

The test statistic $X$ has one of the two the binomial distributions: $b(3, 1/3)$ if $H_0$ is true, and $b(3, 2/3)$ if $H_1$ is true.

**PROBLEM A** (1 pt)

Refer to Problem 7.1-1. What is the power of the test $K$ when the RR $C$ is as it is chosen in this problem?

**PROBLEM B** (3 pt)

Refer to Problem 7.1-1. Calculate $\alpha, \beta$ and $K$ if $C = \{3\}$. Compare these results with the ones obtained in Problems 7.1-1 and B.

**PROBLEM C** (3 pt)

Refer to Problem 7.1-1.

1. Calculate $\alpha, \beta$ and $K$ if the RR $C = \{0\}$.
2. Which RR, considered here or in the previous Problem B, is better (note that the choices of $C$ in these two problems are "opposite")? Use your wise common sense to explain why you would not choose (even without any calculations!) $C = \{0\}$ as the RR (the "rejection region for $H_0$") to test the hypothesis $H_0$?

SEE NEXT PAGE PLEASE!
<table>
<thead>
<tr>
<th>Problem Number</th>
<th>Description</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1-6(a,b)</td>
<td></td>
<td>3+3=6 pt</td>
</tr>
<tr>
<td>7.1-20(a-d)</td>
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<td>3+2+4+3=12 pt</td>
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<tr>
<td>7.4-10</td>
<td></td>
<td>5 pt</td>
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<tr>
<td>7.4-11(d)</td>
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</tbody>
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