Quiz 3

Signature ______________________                               Name_________________________
Student ID _____________________

NOTES:
1. The quiz has 4 questions total. Check the other side for question 3 and 4.
2. For choice questions, there is only one correct answer. It is optional for you to write analysis on the choice questions. If your choice is correct, you will get full credit even without analysis. If your choice is not correct, you could still get partial credit based on your analysis.
3. For question 3 and 4, analysis (one or more sentences) counts up to 50% credit; result counts up to 50% credit.

   (a) 9
   (b) 10
   (c) 11
   (d) 12
   (e) none of the above

3.2 [25 point] We are given an urn that has one red ball and two white ball. A fair die is thrown. If the number is a 1 or 2, one red ball is added to the urn. Otherwise two red balls are added to the urn. A ball is then drawn at random from the urn. Given that a red ball was drawn, what is the probability that a 1 or 2 appeared when the die was thrown? _____
   (a) 4/13
   (b) 5/13
   (c) 5/17
   (d) 7/17
   (e) none of the above
3.3 [25 point] Prove $a_n = n2^{n-1}$ is the solution of recursion $a_0 = 0$, $a_1 = 1$ and $a_n = 4a_{n-1} - 4a_{n-2}$ for $n \geq 2$?

3.4 [25 point] Derive the solution to the recursion $a_n = 10a_{n-1} - 25a_{n-2}$, $a_1 = 1$, $a_2 = 2$. 