

Math 10B with Professor Stankova

Quiz 4; Tuesday, 2/19/2019

Section #203; Time: 11 AM

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Name: \_\_\_\_\_

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Circle True or False or leave blank. (1 point for correct answer, -1 for incorrect answer, 0 if left blank)

1. True    False    If we want to show that the statements  $S_n$  are true for all  $n \geq 0$ , we need to prove the base case  $n = 1$ .
2. True    False    If we use induction to prove a solution to  $a_n = na_{n-1} + 3a_{n-2} - a_{n-3}^2$ , then we will need to use  $S_n, S_{n-1}$ , and  $S_{n-2}$  to prove  $S_{n+1}$ .

Show your work and justify your answers. Please circle or box your final answer.

3. (10 points) (a) (7 points) Prove that  $1 - 2 + \dots + (-2)^n = \frac{1 - (-2)^{n+1}}{3}$  for all  $n \geq 0$ .

- (b) (3 points) What is the probability that when picking a hand of 5 cards out of a deck of 52 cards, you don't have any pairs (or triples/four of a kind)?