

Quiz 5

Question 1 (2 pts)

When a random card is drawn from a standard 52-card deck, the probability that it is red and not a face-card is

- ☐ 5/13
 - ☐ 9/26
 - ☐ 6/13
 - ☐ 10/13
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Question 2 (2 pts)

An urn contains five balls numbered 1, 2, 3, 4, and 5. If a person selects a set of two balls at random, what is the probability that value of the sum of two numbers on the balls is bigger than 5 ?

- ☐ 3/5
 - ☐ 1/2
 - ☐ 2/5
 - ☐ 7/10
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Question 3 (2 pts)

Which of the following sequences is the solution of the recurrence relation

$$a_n = \frac{a_{n-1}}{2a_{n-1}-1}, \quad n = 1, 2, 3, \dots$$

A) $a_n = 2^n - 1$

B) $a_n = 3n + 5$

C) $a_n = \begin{cases} 2, & n = 2k \\ \frac{2}{3}, & n = 2k + 1 \end{cases}$

D) $a_n = n^2 + n + 5$

- ☐ B
- ☐ D
- ☐ C
- ☐ A

Question 4 (2 pts)

A person puts an initial deposit of 200 millions VND to his bank account earning interest at a rate of 6% per year compounded monthly and each month he adds an additional 5 millions VND to the account.

For each nonnegative integer n , let A_n be the amount (in millions VND) in the account at the end of n months.

Which of the following is the recurrence relation relating A_n to A_{n-1} .

A) $A_n = 1.06A_{n-1} + 5$

B) $A_n = 200A_{n-1} + 5$

C) $A_n = 1.005^{12}A_{n-1}$

D) $A_n = 1.005A_{n-1} + 5$

☐ C

☐ B

☐ A

☐ D

Question 5 (2 pts)

Let a_n be a sequence satisfies the recurrence relation

$$a_n = 4a_{n-1} - 4a_{n-2}, \text{ for } n \geq 2 \text{ and } a_0 = 1, a_1 = 3.$$

What is the value of a_{20} ? (fill in the exact number in decimal notation)