Name $\qquad$

Throughout this quiz, show all work and leave answers as meaningful expressions.

Use the following scenario for problems 1-2.
Stephanie Agnail decides to save \$3,000 every year in an account with $2 \%$ interest each year. At the end of each year she first receives $2 \%$ interest on all money in the account, then she deposits another $\$ 3,000$. See the diagram on the board for an illustration of this scenario.

1) Write down the recurrence relation for the amount of money in the account after $n$ years.
2) If the starting value in the account is $\$ 2,000$, find the value of the account after 2 more years.
3) How many 9-bit strings start with 0011 ?
4) A restaurant has 7 appetizers, 14 main dishes, and 6 desserts. How many ways can you order 2 different appetizers, 1 main dish, and 2 desserts? You wouldn't mind getting the same dessert twice.
5) How many numbers between 1 and 600 are divisible by 2 or 3 ?
6) You roll a two dice. One is white, the other is red. How many different outcomes are there?

Consider the recurrence relation below for questions $7-9$.

$$
\begin{gathered}
a_{n}=9 a_{n-1}-14 a_{n-2} \\
a_{0}=1 ; a_{1}=17
\end{gathered}
$$

7) Find a solution to the recurrence relation.
8) Find the general solution to the recurrence relation.
9) Find the particular solution to the recurrence relation with the given initial conditions.
10) A book publishing company is shipping out the latest best-seller today. They are going to ship 1,000 copies divided in some manner between 7 retailers. How many ways can they divide the books between the retailers?
11) Karl is giving out jelly beans. Every jelly bean is a different flavor, and Karl managed to get 33 different flavors! How many ways can he give 10 to you, 10 to Dr. Beyerl, and keep 13 for himself?
12) Calculate $\binom{4}{3}$. (Do the arithmetic until you get a single number as your answer)
