

4. [8 points] A new cryptocurrency ExpCoin was created to have its value grow exponentially over time. The value, in dollars, of one ExpCoin  $t$  years after ExpCoin was invented is given by

$$V(t) = 900(3)^{2t-2}.$$

Fill in the blanks below with correct numbers given in **exact form**.

- a. [2 points] One ExpCoin was worth \$ \_\_\_\_\_ when ExpCoin was invented.
- b. [2 points] The **yearly growth factor** of ExpCoin is \_\_\_\_\_.
- c. [4 points] The value of one ExpCoin grows by \_\_\_\_\_% per **day**. Note that this problem is about the **daily** not yearly growth rate. Assume for this problem that there are 365 days in one year.
5. [10 points] At Rowena's trading card store, she sells regular cards and foil cards. All the cards are rated on their rarity  $R$  which is a number between 0 and 15. A regular card of rarity  $R$  costs  $h(R)$  dollars, while a foil card of rarity  $R$  costs  $f(R)$  dollars. Suppose both  $h(R)$  and  $f(R)$  have inverse functions.
- a. [3 points] Give a practical interpretation of the expression  $h^{-1}(12)$ .
- b. [3 points] Write an equation, possibly involving the functions  $h$  and  $f$ , that expresses the following: "A regular card of rarity 7 costs \$100 more than twice the cost of a foil card of rarity 3."
- c. [4 points] Give a practical interpretation of the equation  $h(f^{-1}(729)) = 180$ .