6. [17 points] Luis and Elena are two biologists studying the population of frogs and butterflies that live in an island. Upon their arrival to the island, they found that there were 2 thousand frogs in the island. Show all your work.

   a. [3 points] Luis believed that the population of frogs living in the island increases by 300 frogs every six months. Let $f(t)$ be the amount of frogs (in thousands) living in the island, t months after they arrived at the island, according to Luis belief. Find a formula for $f(t)$.

$$f(t) = \underline{\hspace{5cm}}$$

   b. [3 points] Elena's hypothesis is that the population of frogs living in the island increases exponentially at a rate of 23% every month. Let $g(t)$ be the amount of frogs (in thousands) living in the island, t months after they arrived at the island, according to Elena's hypothesis. Find a formula for $g(t)$.

$$g(t) = \underline{\hspace{5cm}}$$

As the frog's population increased, the amount of butterflies in the island started to decrease. The population of butterflies 2 and 5 months after Elena and Luis arrived at the island was 20 thousand and 7 thousand respectively.

   c. [4 points] Let $G(t)$ be a linear function describing the population of butterflies (in thousands) t months after the biologists arrive at the island. Find a formula for $G(t)$.

$$G(t) = \underline{\hspace{5cm}}$$

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The statement of the problem has been included for your convenience

As the frog's population increased, the amount of butterflies in the island started to decrease. The population of butterflies 2 and 5 months after Elena and Luis arrived at the island was 20 thousand and 7 thousand respectively.

d. [5 points] Let $H(t)$ be an exponential function describing the population of butterflies (in thousands) t months after the biologists arrive at the island. Find a formula for $H(t)$. Your answer must be in **exact form**.

$$H(t) = \underline{\hspace{3in}}$$

e. [2 points] By what percentage is the population of butterflies reduced every month? Your answer must be accurate up to the first two decimals.

Answer: \underline{\hspace{2in}}