This is a close-book quiz. Please answer the following questions in one sitting on your own (during the period 11/21-11/26). Note how much time you spent on this quiz. Then, login on the EXPLOD web page and upload your answer (between today- 10am 11/27: can upload first answer, can NOT see other answers; between 10 am 11/27 - 11:59pm 11/30: can look at other answers, can upload the second answer).

Here is the current-voltage characteristic of a new non-linear circuit element.

![Current-voltage characteristic graph](image)

**Question 1.** What are the output voltage and current in the DC circuit below?
Three cases (a) \( V_{in} = 1V \), (b) \( V_{in} = 2.2V \), (c) \( V_{in} = 4V \)

![DC circuit](image)

**Question 2.** We added a small signal sinusoidal source at the input, plot output voltage versus time.
Three cases (a) \( V_{in} = 1V \), (b) \( V_{in} = 2.2V \), (c) \( V_{in} = 4V \) (in each case what is the small signal equivalent circuit of the non-linear element)

![Sinusoidal source circuit](image)