

2. [6 points] You are an intern at A&B, Alice & Bob Inc. It's the year 2055, and you're headed to Mars to help the newest A&B store, which will open there on January 1st, 2056.
- a. [3 points] The daily sales of space suits, in thousands, at the new store d Earth days after it opens can be modeled by the sinusoidal function

$$S(d) = 16 \sin\left(\frac{2\pi}{687} \cdot d\right) + 17.$$

- i. The function $S(d)$ has a period of one Mars year. Use this information to find the length of a Mars year in units of Earth days.

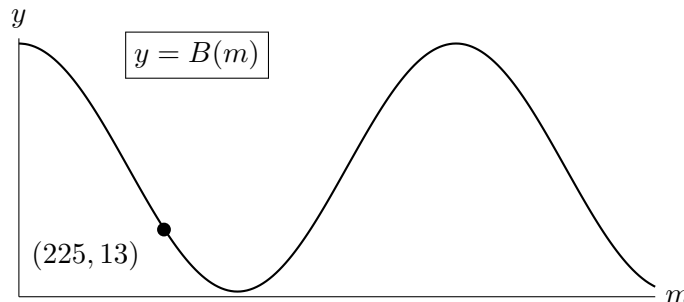
Answer: One Mars year is _____ Earth days.

- ii. According to this model, what are the minimum and maximum daily sales, in thousands, of A&B space suits on Mars?

minimum sales of _____ thousand suits

maximum sales of _____ thousand suits

- b. [3 points] The daily sales of space boots, in thousands, at the new store m Mars days after it opens can be modeled by a different sinusoidal function $B(m)$, which also has a period of one Mars year, which is 670 Mars days. The graph of $B(m)$ is given below. Note that a maximum occurs at $m = 0$.



The first time that daily sales of space boots equals 13,000 is $m = 225$ Mars days after the store opens, as shown on the graph. Find the next two values of m at which daily sales of space boots will equal 13,000 according to this model. You do not need to simplify your answers.

Answer: _____ and _____