

5. [7 points] A local beet company, Dope Beets Inc., is developing a new beet with an adjustable growth rate for its many different customers. The growth rate of their new beet, measured in pounds per day, t days after a beet is planted, is given by

$$r(t) = \frac{5t^2}{t^k + t + 1},$$

for some adjustable value $k > 1$.

- a. [4 points] Suppose a new beet initially weighs 2 pounds. Write an expression involving an integral for the weight, in pounds, of the beet t days after it is planted.

Answer: _____

- b. [3 points] Dope Beets Inc. wants to adjust the value of k such that a planted beet will never have infinite weight, even if the beet is allowed to grow forever. Which values of k would keep the weight finite? Give your answer as a value, list of values, or interval, as appropriate. No justification is required.

Answer: _____