

Exercise 20

For the following exercises, consider this scenario: The weight of a newborn is 7.5 pounds. The baby gained one-half pound a month for its first year.

Find a reasonable domain and range for the function W .

Solution

Because the baby's weight increases at a constant rate, a linear function can be used to model it. The slope is 0.5, the rate that the baby's weight increases (in pounds per month), and the initial weight is 7.5 (in pounds).

$$W(t) = 0.5t + 7.5$$

Since the rate of 0.5 pounds per month only lasts a year, the domain of $W(t)$ is $0 \leq t \leq 12$. To determine the range of $W(t)$, calculate its lowest and highest values.

$$W(0) = 0.5(0) + 7.5 = 7.5$$

$$W(12) = 0.5(12) + 7.5 = 13.5$$

Therefore, the range is $7.5 \leq W \leq 13.5$.