

1.) Let $C(x) = (1 + x^2)^3$. Find functions f and g so that $C(x) = (f \circ g)$ is true for all values of x .

2.) Express the following function $G(x)$ as a composition of two simpler functions

$$G(x) = \frac{1}{(1 + x^4)},$$

one of which is

$$f(x) = \frac{1}{x}.$$

3.) Suppose that in a certain biology lab experiment, the number of bacteria is related to the temperature T of the environment by the function

$$N(T) = -2T^2 + 240T - 5400 \quad (40 \leq T \leq 90).$$

Here, $N(T)$ represents the number of bacteria present when the temperature is T degrees Fahrenheit. Also, suppose that t hours after the experiment begins the temperature is given by

$$T(t) = 10t + 40 \quad (0 \leq t \leq 5)$$

- a.) Compute $N(T(t))$.
- b.) How many bacteria are present when $t = 0$, $t = 2$, and $t = 5$ hours?