3. [12 points] A heater is turned on in a cold room. Let $n = f(T)$ be the number of hours it takes for the heater to warm the room to a temperature of T degrees Fahrenheit (°F). A table of values of this function is given below.

T	61	64	66	67	68
$n = f(T)$	0.5	1.3	2.3	3.3	7

The cost, C, in dollars, to run the heater for n hours is given by the formula

$$C = g(n) = 0.25 + 0.4n.$$

Both f and g are invertible functions.

a. [2 points] Compute the quantities $f^{-1}(0.5)$ and $g(f(68))$.

Answer: $f^{-1}(0.5) =$ _____ and $g(f(68)) =$ _____

b. [2 points] Find a formula for g^{-1} in terms of C.

Answer: $g^{-1}(C) =$ _____

c. [3 points] For each part below, write a phrase or sentence giving a practical interpretation of the given expression or equation, or explain why it doesn't make sense in this context.

i. $g(1) = 0.65$

ii. $f(g(3))$

(Problem continues on the next page.)

(The problem has been restated here for convenience.)

A heater is turned on in a cold room. Let $n = f(T)$ be the number of hours it takes for the heater to warm the room to a temperature of T degrees Fahrenheit (°F). A table of values of this function is given below.

T	61	64	66	67	68
$n = f(T)$	0.5	1.3	2.3	3.3	7

The cost, C, in dollars, to run the heater for n hours is given by the formula

$$C = g(n) = 0.25 + 0.4n.$$

Both f and g are invertible functions.

d. [3 points] For each item below, write an expression or equation, possibly involving the functions f, g, and/or their inverses, that represents the given statement.

i. It takes an hour to heat the room to 63 °F.

ii. the temperature of the room when the heating costs have reached \$1

e. [2 points] Circle the numeral of the one description below that is best supported by the evidence in this problem. Clearly show your work in the space below.

i.Each °F increase in temperature takes the same amount of time.

ii.As the room warms up, it takes an increasing amount of time to heat the room to each additional °F in temperature.

iii.It takes less and less time for the heater to heat the room to each additional °F in temperature.

Work: