3. [8 points] Jaime is on a long car trip. Consider the following functions:

- Let $d(t)$ be the distance, in miles, Jaime has driven t minutes after they begin their trip.
- Let $g(t)$ be the amount of gas, in gallons, in Jaime's car's gas tank t minutes after they begin their trip.

Assume that both functions have inverses. 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.

a. $d(9) = 4$

b. $g(d^{-1}(120))$

c. $g(60) = g(0) - 2$

4. [15 points] Mei is starting a coffee roasting business.

a. [4 points] Mei puts green coffee beans into her roaster. Let $T(t)$ be the temperature, in degrees Fahrenheit (°F), inside the roaster t minutes after she starts roasting the beans. Some values of $T(t)$ are given in the table below.

t	0	3	5	12
$T(t)$	70	370	470	320

Compute the average rate of change of $T(t)$ over the interval $[0, 5]$. **Include units.**

Answer: _____

Could $T(t)$ be concave down on the entire interval $[0, 12]$? Show your work, and circle your final answer.

Answer (*circle one*): **Yes** **No**

This problem continues onto the following page.

This problem continues from the previous page and is restated for your convenience.

Mei is starting a coffee roasting business.

b. [3 points] Let n be a variable representing the number of customers that come into her shop on the dth day it is open (so that $d = 1$ represents the first day she is open, etc.). Is it definitely true that d is a function of n? Briefly explain your answer.
Answer (*circle one*):

Yes, d must be a function of n **No**, d might not be a function of n

Explanation:

c. [5 points] Mei plans to sell her roasted coffee beans for \$15 per pound. However, she plans to offer a deal: once a customer has spent \$60 on coffee beans, any additional beans will only cost \$12 per pound. Find a piecewise-defined formula for $C(p)$, the cost to purchase p pounds of Mei's coffee beans.

Answer: $C(p) =$ _____ for _____

_____ for _____

d. [3 points] Compute $C^{-1}(75)$. Then, using a complete sentence and **including units**, give a practical interpretation of your answer in the context of the problem.

Answer: $C^{-1}(75) =$ _____

Interpretation: