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. \( d(9) = 4 \)
   Solution: When Jaime has driven for 9 minutes, they’ve gone 4 miles.

b. \( g(d^{-1}(120)) \)
   Solution: the amount of gas, in gallons, in Jaime’s car’s tank when they’ve driven 120 miles.

c. \( g(60) = g(0) - 2 \)
   Solution: 60 minutes into their trip, Jaime’s car has 2 fewer gallons of gas than when their trip started.

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.

   \[
   \begin{array}{c|cccc}
   t & 0 & 3 & 5 & 12 \\
   \hline
   T(t) & 70 & 370 & 470 & 320 \\
   \end{array}
   \]

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

   Solution: \( \frac{470 - 70}{5 - 0} = \frac{400}{5} = 80 \)

   Answer: 80°F per minute

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

   Solution: The average rates of change over the three consecutive subintervals are \( \frac{370 - 70}{3 - 0} = 100, \frac{470 - 370}{5 - 3} = 50, \) and \( \frac{320 - 470}{12 - 5} < 0. \) Since these are decreasing, yes, the function could be concave down on this interval.

   Answer (circle one): Yes  No

This problem continues onto the following page.