7. [12 points] Phillip Asafy and Genevieve Omicks both enjoy hot chocolate when it's cool outside. They made a few measurements, and these appear in the table below.

P (respectively G) is Phil's (respectively Gen's) consumption of hot chocolate (in quarts, measured to the nearest tenth of a quart) in a month when the average daily high temperature is H (in degrees Celsius, measured to the nearest degree).

$H(^\circ C)$	P (quarts)	G (quarts)
3	16.1	13.3
7	12.8	11.6
15	8.0	6.5

a. [8 points] Based on this data, could either student's monthly hot chocolate consumption be reasonably modeled as a linear function of average daily high temperature? An exponential function? Neither? Carefully justify your answer in the space below. (Hint: *At least* one of these can be modeled by a linear or an exponential function!)

Answers: Circle <u>one</u> choice for each student.

Phil's consumption P: linear exponential neither linear nor exponential

Gen's consumption G: linear exponential neither linear nor exponential

b. [4 points] For this investigation, their friend Maddy measures temperature in degrees Fahrenheit, and she measures her hot chocolate consumption in cups. She finds a function $M(f)$ which is the number of cups of hot chocolate she consumes in a month when the average daily high temperature is f degrees Fahrenheit. If $Q(H)$ is the number of *quarts* of hot chocolate Maddy consumes when the average monthly temperature is H degrees *Celsius*, write a formula for $Q(H)$ in terms of M and H.
Recall that there are 4 cups in a quart and that the conversion from Fahrenheit to Celsius is given by $y = \frac{5}{9}(x - 32)$ *(where* $y^\circ C$ *and* $x^\circ F$ *describe the same temperature).*

Answer: $Q(H) =$ _____