7.5 Training Day Part II
A Practice Understanding Task

Fernando and Mariah continued training in preparation for the half marathon. For the remaining weeks of training, they each separately kept track of the distance they ran during the week. Since they ran together at the same rate on Saturdays, they took turns keeping track of the distance they ran and the time it took. So they would both keep track of their own information, the other person would use the data to determine their own total distance for the week.

Week 2: Mariah had completed 15 more laps than Fernando before they trained on Saturday.

a. Complete the table for Mariah.

Time (in minutes on Saturday)	0	10	20	30	40	50	60
Fernando: Distance (in laps)	50	56	62	68	74	80	86
Mariah: Distance (in laps)							

b. Write the equation for Mariah as a transformation of Fernando. Equation for Mariah: $m(t) = f(t)$ _____

Week 3: On Saturday morning before they started running, Fernando saw Mariah's table and stated, "My equation this week will be $f(t) = m(t) + 30$."
a. What does Fernando's statement mean?
b. Based on Fernando's translated function, complete the table.

Time (in minutes on Saturday)	0	20	40	60	70
Fernando: Distance (in laps)					
Mariah: Distance (in laps)	45	57	69	81	87

c. Write the equation for both runners:

d. Write the equation for Mariah, transformed from Fernando.

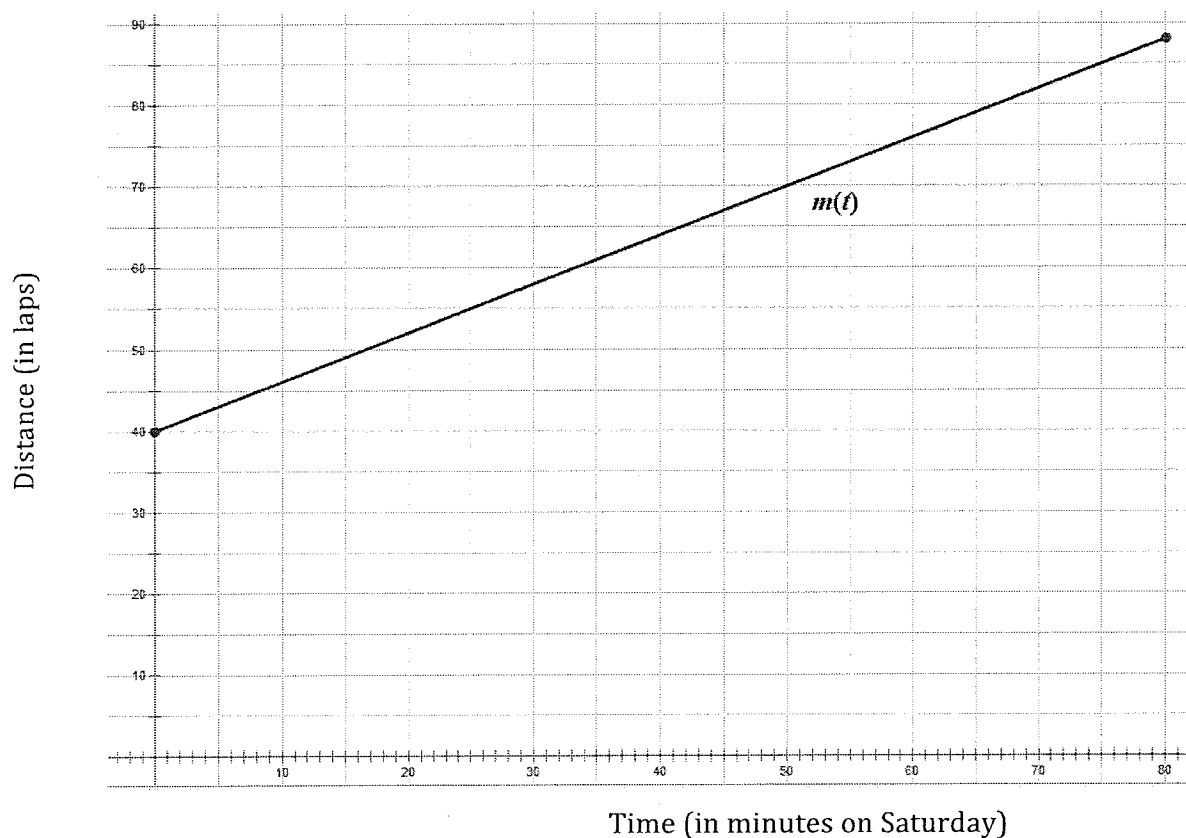e. What relationship do you notice between your answers to parts c and d?

Week 4: The marathon is only a couple of weeks away!

a. Use Mariah's graph to sketch $f(t)$. $f(t) = m(t) - 10$

Time (in minutes on Saturday)

b. Write the equations for both runners.
c. What do you notice about the two graphs? Would this always be true if one person ran "k" laps more or less each week?

Week 5: This is the last week of training together. Next Saturday is the big day. When they arrived to train, they noticed they had both run 60 laps during the week.

a. Write the equation for Mariah given that they run at the same speed that they have every week.
b. Write Fernando's equation as a transformation of Mariah's equation.

What conjectures can you make about the general statement: "$g(x) = f(x)+k$" when it comes to linear functions?