Unit 5 Lesson 10: Combining Functions

1 Notice and Wonder: Are Book Sales Improving? (Warm up)

Student Task Statement

What do you notice? What do you wonder?

| t (years since 2010)	number of books sold in the US (millions)	population of the US (millions)
0	2,530	309.35
1	2,400	311.64
2	2,730	313.99
3	2,720	316.23
4	2,700	318.62
5	2,710	321.04
6	2,700	323.41

2 How Many Books Can One Person Have?

Student Task Statement

The table shows the values of two functions, P and B, where $P(t)$ is the population of the US, in millions, t years after 2010, and $B(t)$ is the number of books sold per year, in millions, t years after 2010.

t (years since 2010)	$B(t)$ (millions)	$P(t)$ (millions)	$R(t)$
0	2,530	309.35	
1	2,400	311.64	
2	2,730	313.99	
3	2,720	316.23	
4	2,700	318.62	
5	2,710	321.04	
6	2,700	323.41	

1. Plot the values of B as a function of t. What does the plot tell you about book sales?
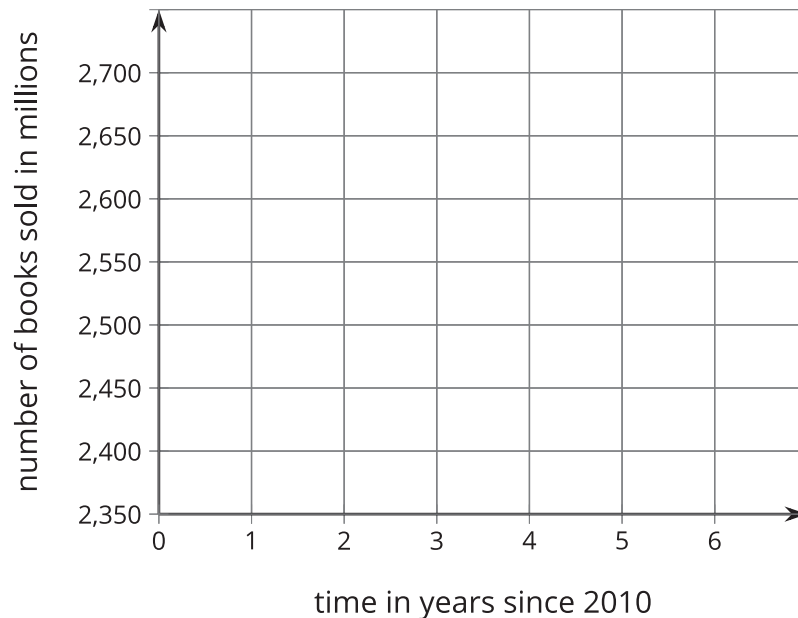

2. How many books were sold per person in 2010 and 2016? What do these values tell you about book sales?

3. Define a new function R by $R(t) = \frac{B(t)}{P(t)}$. Complete the table and then graph the values of $R(t)$. What do the values of R tell you?

3 Adding Functions

Student Task Statement

1. Here are the graphs of two functions, E and L. Define a new function S by adding E and L, so $S(x) = E(x) + L(x)$. On the same axes, sketch what you think the graph of S looks like.
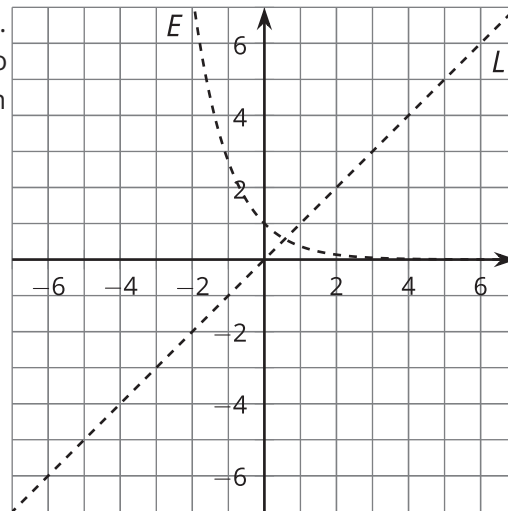
2. Sketch the graph of the sum of E and each of the following functions.