



## Geri's Greeting Cards



The greeting card selections at stores are regularly updated and new displays are set up each season. Each style of card comes in a multi-pack with the corresponding envelopes. These packages must be opened and then placed in the correct slot. Geri's job is to stock greeting cards at a variety of stores.

1. Geri has already stocked 3 packages by the time her shift officially starts. Additional information about the number of packages she has stocked at various times in her shift is given in the table.

Time (Hours)	Number of packages stocked
0	3
0.5	38
1	73
1.5	108
2	143
2.5	178

- a. What do you notice about the information in the table? Describe any patterns you see.
  - b. At what rate is Geri stocking the packages?
2. Write an equation for  $P(x)$ , the number of packages Geri will have stocked  $x$  hours after her shift begins.
  3. If Geri has to stock 150 packages of cards, how long will it take her?
  4. The greeting card industry is on the decline. In 2020, Americans purchased approximately 6.5 billion greeting cards each year. Between 2018 and 2023, this number has continued to decrease at approximately 2.8% per year. According to this estimate, how many greeting cards were purchased in 2021?
  5. What is the ratio of greeting card purchases from 2021 compared to 2020?

6. Complete the table.

Year	Annual number of greeting cards purchased (in billions)
2018	
2019	
2020	6.5
2021	
2022	
2023	

7. Is the number of greeting cards purchased annually decreasing by the same amount each year? Explain.
8. Write an equation for  $G(x)$ , the number of annual greeting cards purchased  $x$  years after 2018.
9. Compare your expressions for  $P(x)$  and  $G(x)$  from this activity. What makes them different? What similarities do they have?

## Lesson 4.3 – Linear and Exponential Functions

QuickNotes

### Check Your Understanding

1. A table of selected values is given for a function  $f$ . Does  $f$  appear to be a linear function, an exponential function, or neither? How do you know?

$x$	$f(x)$
-5	15
-3	8.5
-1	2
2	-7.75
4	-14.25

2. a. Write the equation of a linear function that passes through (1,63) and (3,7).
- b. Write the equation of an exponential function that passes through (1,63) and (3,7).
3. A geometric sequence has a common ratio of 4 and  $a_2 = 24$ . Which of the following could be used to generate the terms of this sequence?
- A) An arithmetic sequence with a common difference of 4 and  $a_2 = 24$
  - B) A linear function with a y-intercept of 16, a slope of 4, and a domain of positive integers
  - C) An exponential function with a y-intercept of 1.5, a constant proportion of 4, and a domain of positive integers.
  - D) An exponential function with a y-intercept of 6, a constant proportion of 4, and a domain of all real numbers.