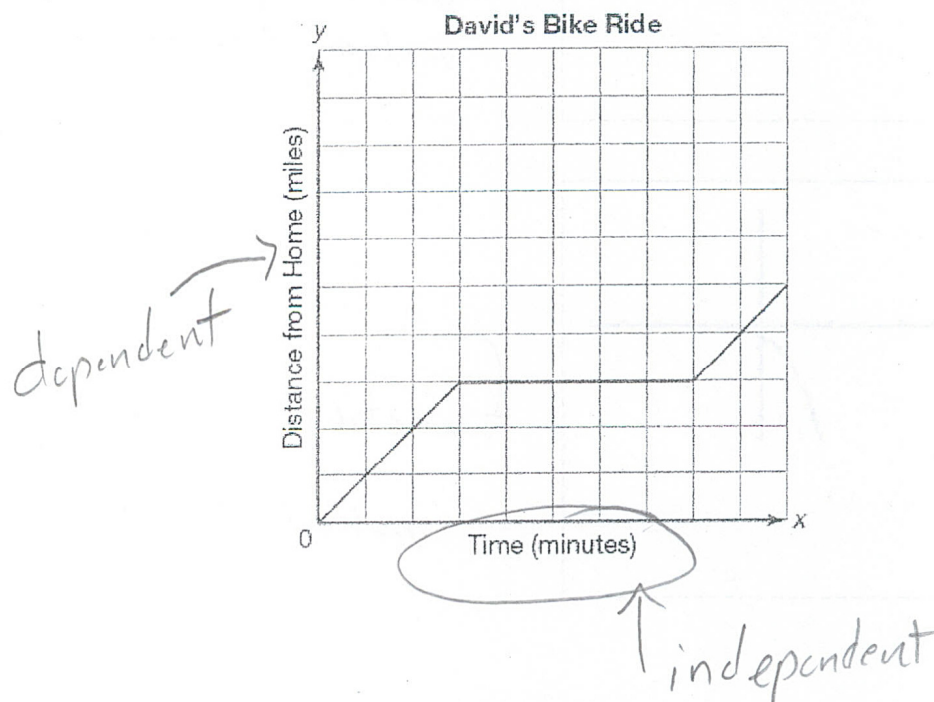


## Integrated 3 Review

## Integrated 3 Review Day 1: Function Notation, Graphing Linear Functions, Using the Vertical Line Test

1. Hector knows there is a relationship between the number of cars he washes and the time it takes him to wash those cars. Identify the independent quantity and the dependent quantity in the problem situation.  
*time = independent    # of cars washed = dependent*
2. David rode his bike to the park. After staying at the park for a few minutes, he then continued his ride to the grocery store. The graph shows this relationship. In the graph, what is the independent quantity and what is the dependent quantity?

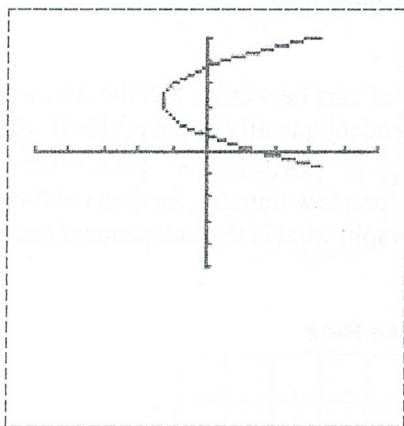


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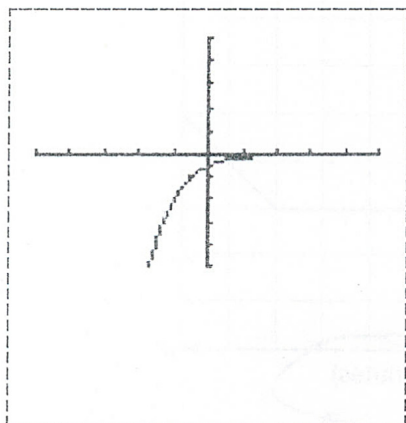
3. Tell whether each graph represents a function.

a.



Not a function,  
does not pass the  
vertical line test.

b.



function, passes the  
vertical line test

4. An elevator in a high-rise building moves upward at a constant rate. The table shows the height of the elevator above the ground floor after various times.

|            | Time    | Height |
|------------|---------|--------|
| Units      | Seconds | Feet   |
|            | 0       | 0      |
|            | 1       | 12     |
|            | 2       | 24     |
|            | 3       | 36     |
|            | 4.5     | 54     |
|            | 5       | 60     |
| Expression | $t$     | $12t$  |

- a. What are the dependent and independent quantities in this problem situation? Explain your reasoning.

independent = time  
dependent = height

- b. Determine the unit rate of change for the problem situation.

$$m = 12 \text{ ft/sec}$$

- c. Complete the table. Write an expression that represents the height for an arbitrary time  $t$  seconds in the last row.

$$12t$$

- d. Use function notation to determine the height of the elevator at a time of 14 seconds.

$$h(t) = 12t$$

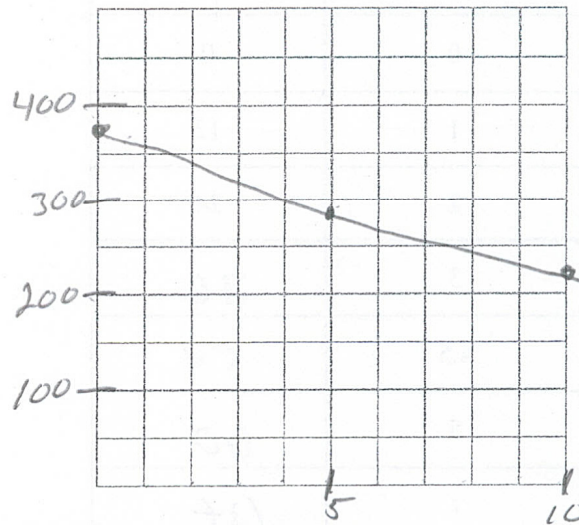
$$h(14) = 168 \text{ ft}$$

5. Suppose an elevator starts at the top floor of a high-rise building at a height of 372 feet above the ground floor and descends without stopping at a constant rate of 15 feet per second.

a. Write a function that describes the height,  $h$ , of the elevator after  $t$  seconds.

$$h(t) = 372 - 15t$$

b. Graph the function that you wrote in part (a).



| $t$ | $h(t)$ |
|-----|--------|
| 0   | 372    |
| 5   | 297    |
| 10  | 222    |

c. Estimate when the elevator is at a height of 200 feet.

d. Determine the exact time that the elevator is at a height of 200 feet. Round to the nearest hundredth. Write your answer as an ordered pair.

$$200 = 372 - 15t$$

$$-172 = -15t$$

$$11.5 \approx t$$

6. Evaluate the function  $f(x) = 31.572x - 17.741$  at each of these values. Write your answers as an ordered pair.

a.  $f(6.2)$

$$f(6.2) = 178.005$$

$$(6.2, 178.005)$$

b.  $f(-27.018)$

$$f(-27.018) = -870.753$$

$$(-27.018, -870.753)$$



7. Harland owns a vegetable stand. He grows and sells his own vegetables at a stand in the city. He charges \$0.75 for each tomato, and each month five lucky passers-by get a free tomato. Harland always sells more tomatoes than he gives away.

- a. Write a linear function using function notation to represent the amount Harland earns each month. Let  $x$  represent the number of tomatoes distributed.

$$t(x) = 0.75(x - 5)$$

- b. How much would Harland earn in a month if he distributed 80 tomatoes to customers? Show your work.

$$t(80) = 0.75(80 - 5)$$

- c. The next month, Harland decides to also sell cucumbers for \$0.60 each. Each month three lucky passers-by get a free cucumber. He always sells more cucumbers than he gives away. Write a linear function to represent the amount of money Harland earns each month from cucumber sales. Let  $x$  represent the number of cucumbers distributed.

$$c(x) = 0.60(x - 3)$$

- d. Harland writes a function for the total amount of money he will earn for selling both items. His work is shown below. Is Harland correct? Explain why or why not.

$$p(x) = t(x) + c(x)$$

$$p(x) = 0.75(x - 5) + 0.6(x - 3)$$

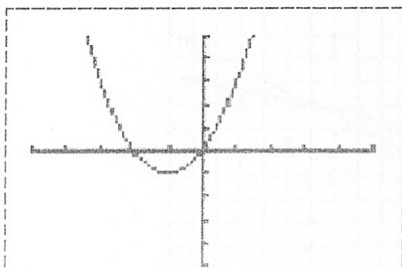
$$p(x) = 0.75x - 3.75 + 0.6x - 1.8$$

$$p(x) = 1.35x - 5.55$$

Harland is incorrect because he does not make \$1.35 for each item sold or  $x$  can only represent one of the fruits.

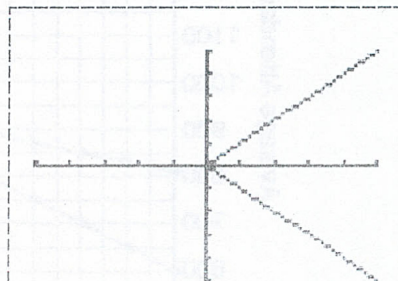
8. Tell whether each graph represents a function.

a.



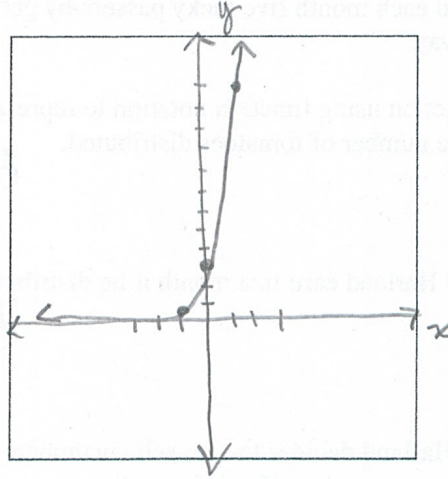
Function,  
passes Vert. line  
test.

b.



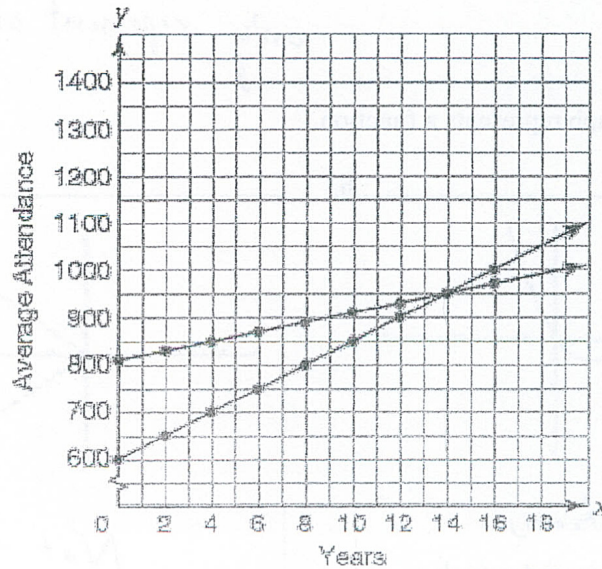
Not a function  
fails Vert. line test

9. Identify each of the following for the function  $f(x) = 3 \cdot 4^x$ . Then graph the function.



- a. x-intercept(s) *None*
- b. y-intercept *y = 3*
- c. asymptote *y = 0*
- d. domain *all real #'s*
- e. range *y > 0*
- f. interval(s) of increase/decrease *(-∞, ∞)*

10. The graph shows the average attendance for two schools. What does the solution  $x = 14$  represent?



$x = 14$  is where the average daily attendance is the same for both schools