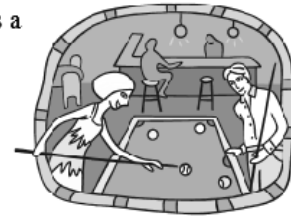


## Lesson 4-3 The Domain Makes the Range



The path of a billiard ball during a bank shot can also be expressed as a *nonlinear function*. During one particular bank shot, the distance  $d$  of the ball from the bumper (feet) as time  $t$  passes by (seconds) can be described by the *function*  $d(t) = |3 - 2t|$ .

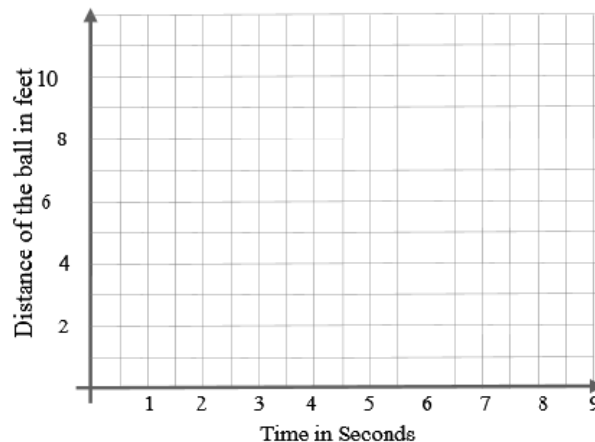


1. Evaluate  $d(t)$  for the identified domain values. Show all your work. Round each answer to the nearest whole number.  $d(t) = |3 - 2t|$

- a.  $d(4)$                       b.  $d(7)$                       c.  $d(-8)$                       d.  $d(0)$

2. Complete the domain/range table for function  $d$  and graph.

Domain (Time in sec.)	Range (Distance in ft.)
0	
1	
2	
3	
4	
5	
6	
7	
8	
9	



3. For the function  $d(t) = |3 - 2t|$ :
- Are there any restrictions on the range for this function? (The range for this function is the distance that the ball travels on the table.) If so, what are they?
  - Use an inequality to express the reasonable range.
  - Using this range, express the domain of this function as an inequality. (These are the values that are the answers when you plug in the domain.)
  - Find  $d(0)$ . Explain what this value means.

Using  $h$  for height in inches and  $t$  for time in years, the height of an average boy through the age of 18 can be expressed as  $h(t) = 6.7\sqrt{3t} + 20$ .

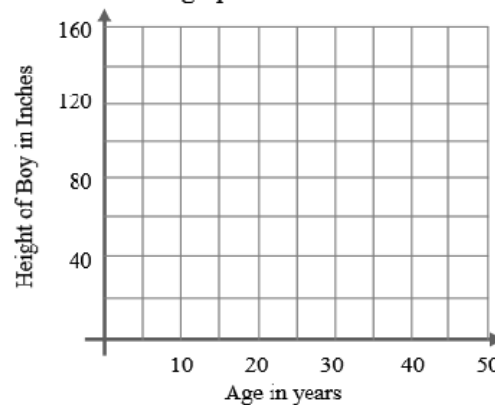


4. Evaluate function  $h$  over the identified domain values. Show all your work. Round each answer to the nearest whole number.  $h(t) = 6.7\sqrt{3t} + 20$ .

- a.  $h(3)$                       b.  $h(12)$                       c.  $h(-4)$                       d.  $h(0)$

5. Complete the domain/range table for function  $h$  and graph.

Domain (Age in years)	Range (Height in in.)
0	
5	
10	
15	
20	
25	
30	
35	
40	
45	
50	



6. For the function  $h(t) = 6.7\sqrt{3t} + 20$ :

- Are there any restrictions on the domain for this function? (The domain for this function is the age of the boy in years during his growth period.) If so, what are they?
- List the reasonable domain values in a set.
- Using this domain, what is the range of this function? (What are the values that are the answers when you plug in the domain?)
- Find  $h(0)$ . Explain what this value means.

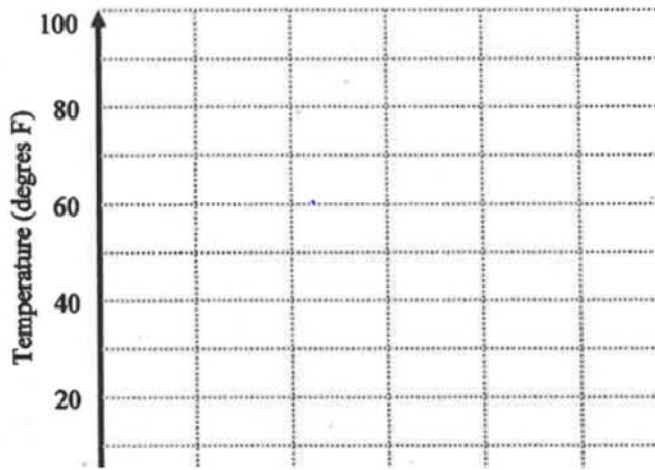
4-3.C (Practice)

Show all work

Name \_\_\_\_\_ per \_\_\_\_\_

1. If you eat ice cream on a hot summer day, you have to eat it quickly before it melts, or you have a mess! Let the function  $f(x) = 14\sqrt{x} + 20$  represent the temperature of the ice cream where  $x$  is the time in the sun (in minutes) and  $f(x)$  is the temperature of the ice cream (in degrees Fahrenheit.) Complete the table and graph this function.

$x$	$f(x) = 14\sqrt{x} + 20$	$f(x)$
0		
5		
10		
15		
20		
25		
30		
35		



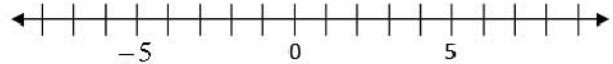
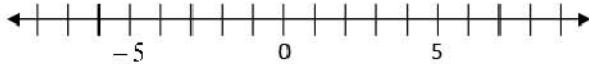
Approximately how long will it take for the temperature of the ice cream to reach 60 degrees?

2. Solve and graph on a number line

$$|2x - 3| > 17$$

3. Solve and graph on a number line

$$3|7x - 14| = 21$$



4. Write and solve a proportion: You are riding your bike. It takes you 28 minutes to go 8 miles. If you continue traveling at the same rate, how long will it take you to go 15 miles?