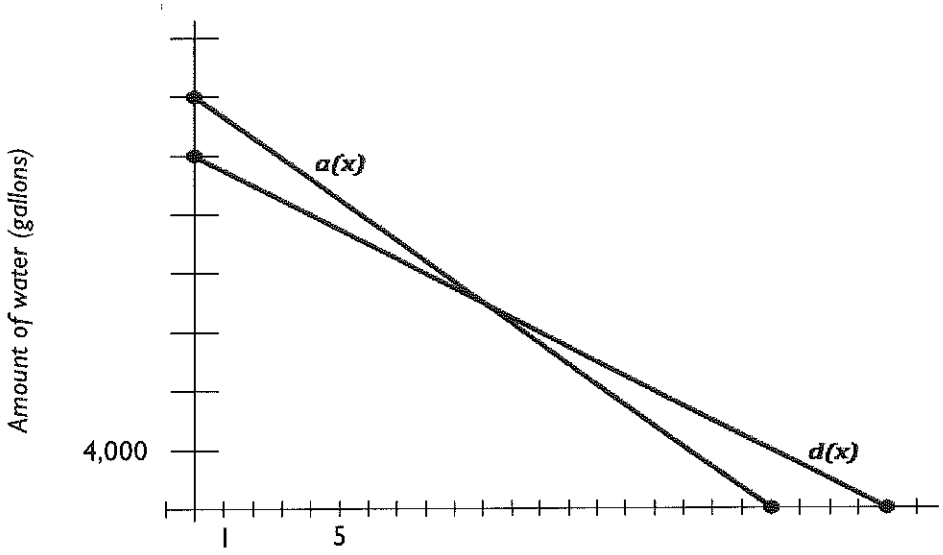
3.5 Pooling it Together

A Solidify Understanding Task

Aly and Dayne work at a water park and have to drain the water at the end of each month for the ride they supervise. Each uses a pump to remove the water from the small pool at the bottom of their ride. The graph below represents the amount of water in Aly's pool, $a(x)$, and Dayne's pool, $d(x)$, over time. In this scenario, they decided to work together to drain their pools and created the equation:

$$g(x) = a(x) + d(x).$$



Answer the following questions about $g(x)$.

1. What does $g(x)$ represent?

2. Create the graph of $g(x)$ on a new set of axes using the graphs of $a(x)$ and $d(x)$. Identify $g(x)$ and label (scale, axes).

3. Write the equation for the function $g(x)$ using the graph you created. Compare this equation to the algebraic representation of finding the sum of the equations for $a(x)$ and $d(x)$. (The equations were created in the last task, "The Water Park" task).

4. Should the algebraic equation of $g(x)$ be the same as the algebraic function created from the graph? Why or why not?

5. Use both the graphical as well as the algebraic representation to describe characteristics of $g(x)$ and explain what each characteristic means (each intercept, domain and range for this situation and for the equation, maxima and minima, whether or not $g(x)$ is a function, etc.)

6. Explain why adding the two values of the y-intercepts together in $a(x)$ *and* $d(x)$ can be used to find the y-intercept in $g(x)$.

7. Can a similar method be used to find the x-intercepts? Explain.

READY, SET, GO! Name Period Date

READY

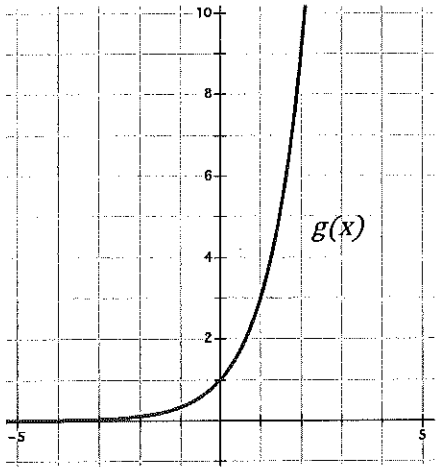
Topic: Interpreting function notation to find the output or input based on what is given

For each function, find the indicated values.

1. *Given:* $h(t) = 2t - 5$

a. $h(-4) =$ ____ b. $h(t) = 23,\ t =$ ____ c. $h(13) =$ ____ d. $h(t) = -33,\ t =$ ____

2.



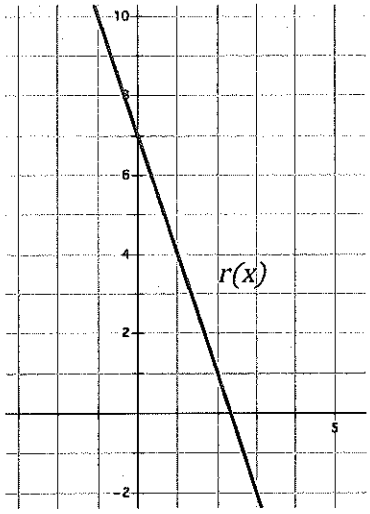
a. $g(2) =$ ____

b. $g(x) = 3,\ x =$ ____

c. $g(0) =$ ____

d. Write the explicit rule for $g(x)$.

3.



a. $r(-1) =$ ____

b. $r(x) = 4,\ x =$ ____

c. $r(2) =$ ____

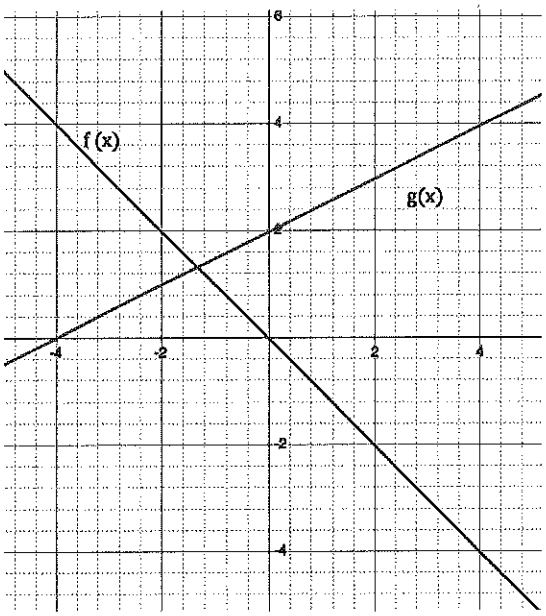
d. Write the explicit rule for $r(x)$.

SET

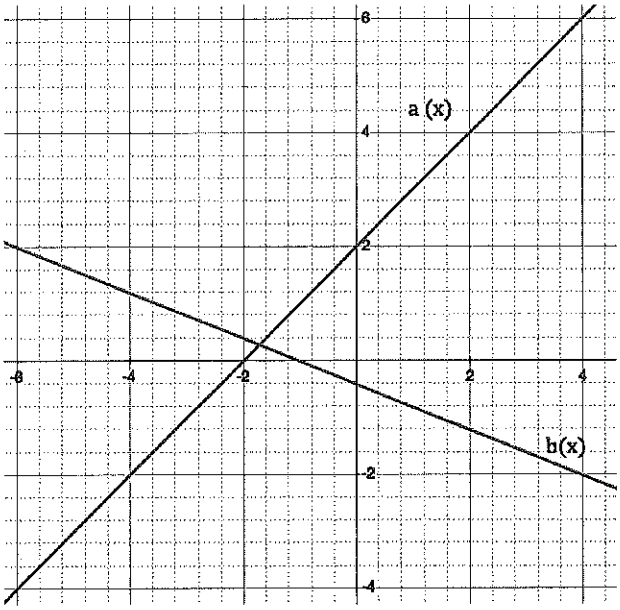
Topic: Adding functions

Two functions are graphed. Graph a new function on the same grid by adding the two given functions.

4. $h(x) = f(x) + g(x)$



5. $s(x) = a(x) + b(x)$



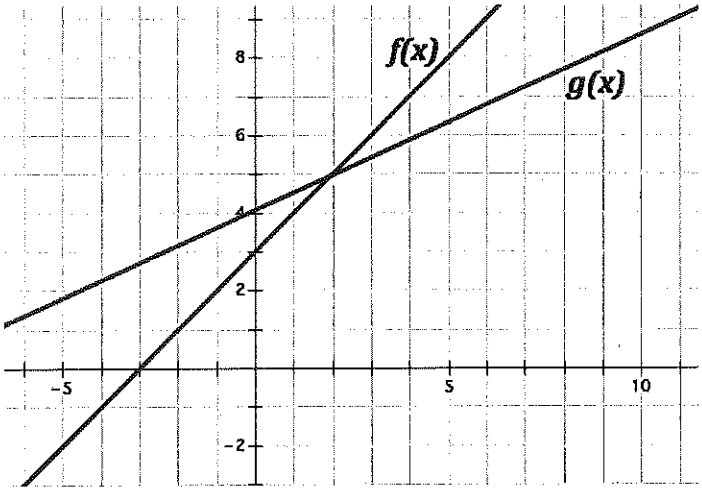
5. Use the graph to answer the following questions.

a. Where does $f(x) = g(x)$?

b. What is $f(4) + g(4)$?

c. What is $g(-2) - f(-2)$?

d. State the interval where $g(x) > f(x)$.



6. Use the graph to answer the following questions.

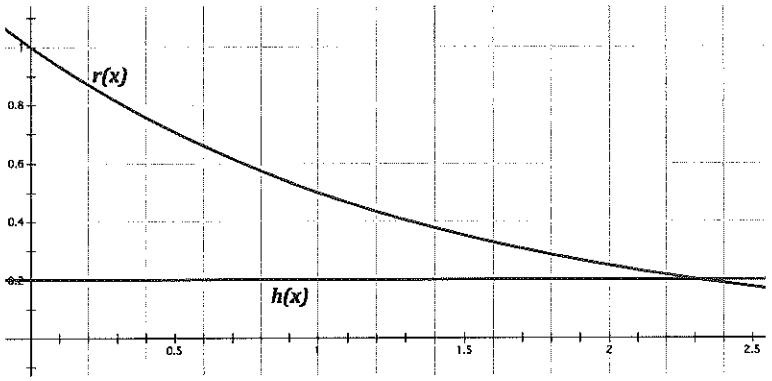
a. Where is $r(x) > h(x)$?

b. What is $r(1) - h(1)$?

c. What is $r(0) + h(0)$?

d. Write an explicit rule for $r(x)$ and for $h(x)$.

e. Sketch $r(x) - h(x)$ on the graph.



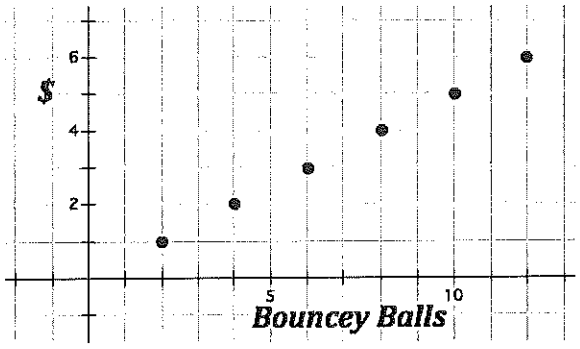
GO

Topic: Distinguishing between discrete and continuous functions

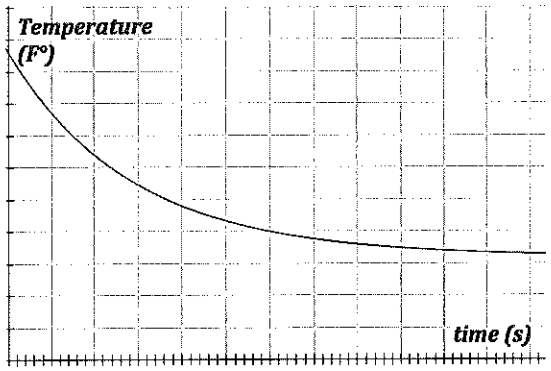
For each context or representation determine whether it is discrete or continuous or could be modeled best in a discrete or continuous way. Justify your answer.

8. Susan puts exactly $5 a week in her piggy bank.

9.



10.



11. Marshal tracks the number of hits he gets each baseball game and is recording his total number of hits for the season in a table.

12. The distance you have traveled since the day began.

13.

Number of gumballs	Cost
5	10¢
10	20¢
15	30¢
20	40¢

14. Stephen deposited $1,000 in a savings account at the bank when he turned 21. He deposits $100 each month. He plans to never withdraw any money until the balance is $150,000.