

NOTES & HOMEWORK

Name _____
Date _____ Period _____
Function Notation & Interpreting Graphs

Define the following terms:

Domain –

Range –

Function Notation – uses parentheses to name the input or independent variable for the function.

For instance, $y = f(x)$, which you read as “y equals f of x,” says “y is a function of x” or

“y _____ on x.”

(In function notation, the parentheses do NOT mean multiplication.)

You can show some function with an equation. For example, the equation $y = 2x + 4$ represents a function, so you can write it as $f(x) = 2x + 4$.

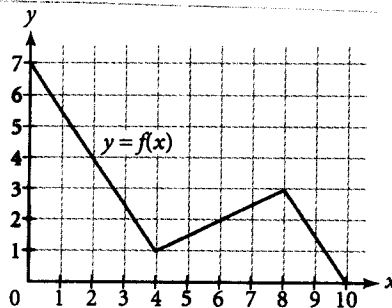
The notation $f(3)$ tells you to substitute 3 for x in the equation $y = 2x + 4$.

So, $f(3) = 2(3) + 4$ The value of $f(x)$ when $x = 3$ is _____.

Not all functions are expressed as equations. The graph shows a new function, $f(x)$. No rule or equation is given, but you can still use function notation to find output values.

For example, on the graph below, the point at $x = 4$ has the coordinates $(4, f(4))$ or $(4, 1)$. The value of y when x is 4 is $f(4) = 1$. What is the value of $f(2)$? _____ What is the value $f(6)$? _____

Find two x-values for which $f(x) = 1$? _____



You can use the function $f(x) = \frac{9}{5}x + 32$ to find the temperature $f(x)$ in degrees Fahrenheit for any given temperature x in degrees Celsius. Find the specified value.

a.) $f(15)$

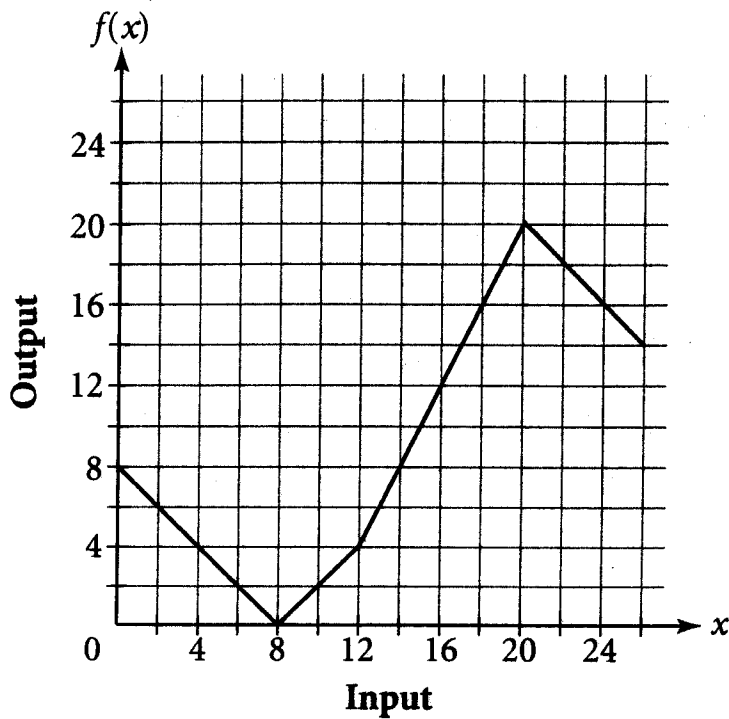
b.) $f(-10)$

c.) $f(5)$

d.) x when $f(x) = -4$

A Graphic Message

Name _____ Period _____ Date _____



Notation	Value
$f(3)$	
$f(18) + f(3)$	
$f(5) + f(4)$	
$f(15) \div f(6)$	
$f(20) - f(10)$	

Notation	Value
$f(0) + f(1) - 3$	
$5 \cdot f(9)$	
x when $f(x) = 10$	
$f(9 + 8)$	
$\frac{f(17) + f(10)}{2}$	
$f(8 \cdot 3) - 5 \cdot f(11)$	
$f(4 \cdot 5 - 1)$	
$f(12)$	

Lesson 8.4 • Function Notation

Name _____ Period _____ Date _____

1. Find each function value for $f(x) = 4x - 7$ and $g(x) = -3x + 5$ without using your calculator. Then enter the equation for $f(x)$ into Y_1 and the equation for $g(x)$ into Y_2 . Use function notation on your calculator to check your answers.

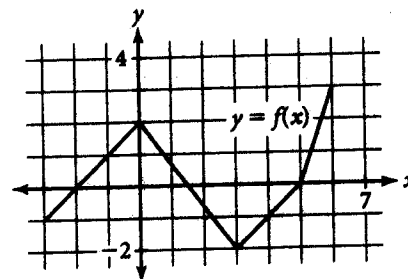
- | | | | |
|--------------|--------------------------------|----------------------------------|--------------|
| a. $f(2)$ | b. $f(0)$ | c. $f(-3)$ | d. $g(1)$ |
| e. $g(6)$ | f. $g(-7)$ | g. $f(0.5)$ | h. $g(0.5)$ |
| i. $f(3.25)$ | j. $g\left(\frac{2}{3}\right)$ | k. $f\left(-\frac{11}{8}\right)$ | l. $g(-2.3)$ |

2. Find the y -coordinate corresponding to each x -coordinate if the functions are $f(x) = 2x^2 + x - 3$ and $g(x) = 40(0.8)^x$. Check your answers with your calculator.

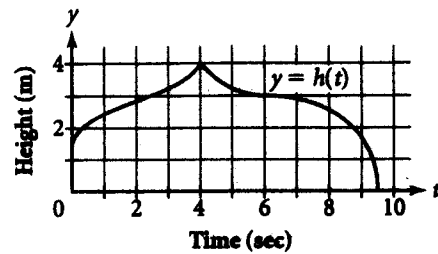
- | | | | |
|--------------|------------|-----------|------------|
| a. $f(1)$ | b. $f(-3)$ | c. $f(0)$ | d. $f(4)$ |
| e. $f(-0.5)$ | f. $g(1)$ | g. $g(0)$ | h. $g(-2)$ |
| i. $g(3)$ | j. $g(-1)$ | | |

3. Use the graph of $y = f(x)$ to answer each question.

- What is the value of $f(0)$?
- What is the value of $f(3)$?
- For what x -value or x -values does $f(x)$ equal 3?
- For what x -value or x -values does $f(x)$ equal 0?
- For what x -values is $f(x)$ less than 0?
- What are the domain and range shown on the graph?

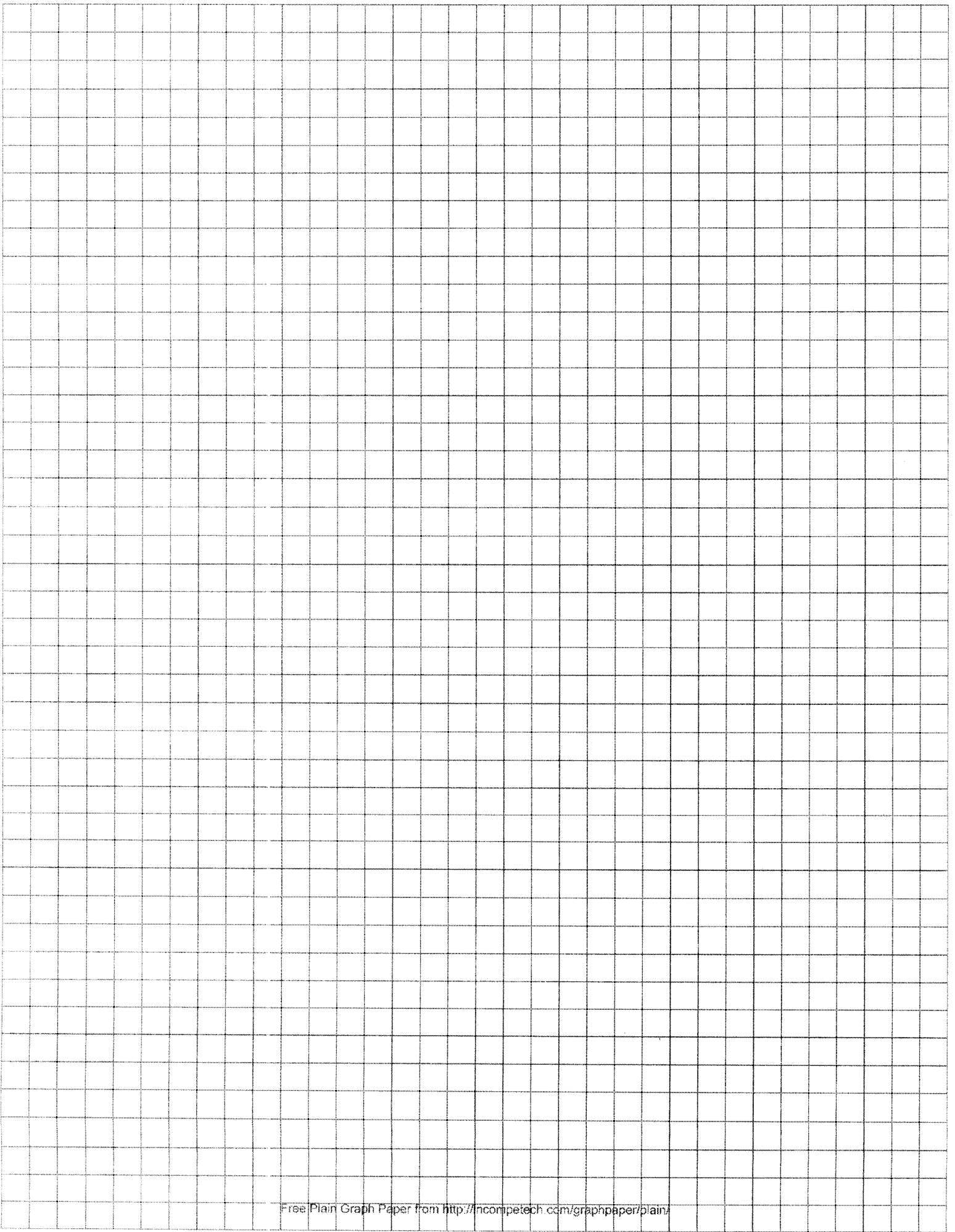


4. The graph of the function $y = h(t)$ shows the height of a paper airplane on its maiden voyage.
- What are the dependent and independent variables?
 - What are the domain and range shown on the graph?
 - Use function notation to represent the plane's height after 6 seconds.
 - Use function notation to represent the time at which the plane was 4 meters high.

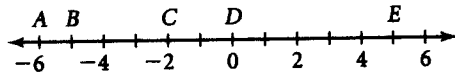


5. Use function notation to write an equation for the line through each pair of points.
- $(-2, 5), (4, -3)$
 - $(-7, -4), (0, -11)$
 - $(3, 4), (-2.4, 4)$

1. Sketch a graph of a continuous function to fit each description.
- Linear and increasing, then linear and decreasing
 - Neither increasing nor decreasing
 - Increasing with a slower and slower rate of change
 - Decreasing with a slower and slower rate of change, then increasing with a faster and faster rate of change
 - Increasing with a slower and slower rate of change, then increasing with a faster and faster rate of change
 - Decreasing with a slower and slower rate of change, then decreasing with a faster and faster rate of change

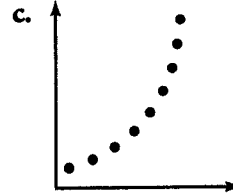
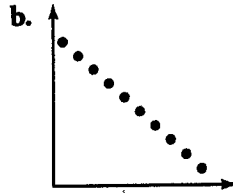


2. Write an inequality for each interval in 2a–f. Include the least point in each interval and exclude the greatest point in each interval.



- a. A to B b. B to D c. A to C
d. B to E e. C to E f. C to D

3. Describe each of these discrete function graphs using the words *increasing*, *decreasing*, *linear*, *nonlinear*, and *rate of change*.



4. Sketch a discrete function graph to fit each description.
- Increasing with a constant rate of change
 - Increasing with a slower and slower rate of change
 - Increasing with a faster and faster rate of change