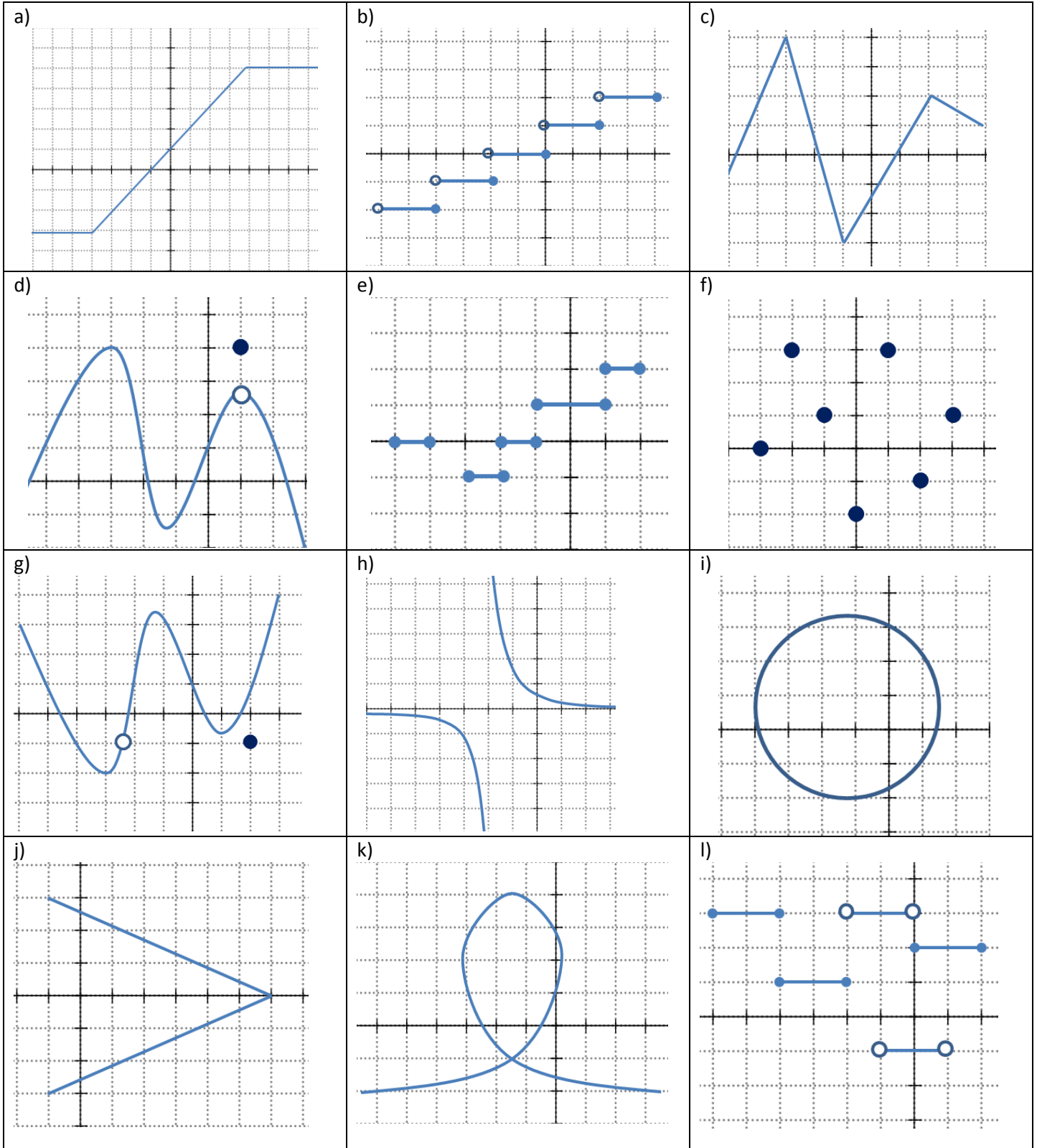Name:_____   Date:_____

Math 9 Enriched: Section 8.2 Introduction to Function Notations

1. Indicate which of the following graphs are functions.

a)	b)	c)

d)	e)	f)

g)	h)	i)

j)	k)	l)

2. Given the functions, $f(x) = 3x^2 - 2x$ and $g(x) = -\dfrac{3x}{2} + 3$, find the indicated values:

i) $f(3) \times g(4)$

ii) $2f(-2) - 3g(2)$

iii) $4f(2) \times g(-3)$

3. Given the functions, $f(x) = \sqrt{x} + 3$ and $g(x) = 2x^2 - 1$, find the indicated values:

i) $f(g(x))$

ii) $g(f(x))$

iii) $g(f(g(x)))$

iv) $f(g(3))$

v) $g(f(18))$

vi) $g(f(g(5)))$

vii) $f(f(x))$
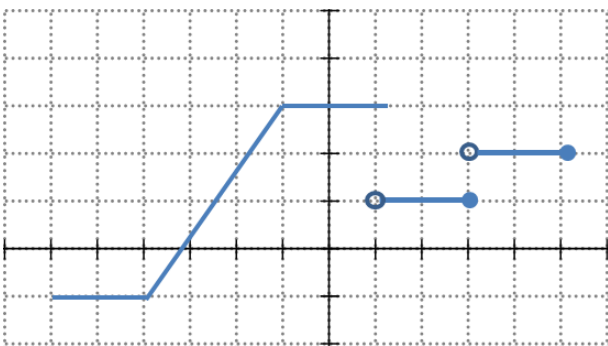
viii) $g(g(f(25)))$

ix) $f(g(f(50)))$

4. If $f(x) = x^2 + 3x - 10$, find the value of "x" that will make the expression true:

i) $f(x) = 0$

v) $f(x) = 8$

vi) $f(x) = -6$

5. Given the graph of $f(x)$, find the indicated values:

$i) f(2) =$

$ii) f(1) =$

$iii) f(4) =$

$v) f(?) = 3$

$vi) f(-4) \times f(3)$

6. If $f(x)=x^2-x+2$, $g(x)=ax+b$, and $f(g(x))=9x^2-3x+2$, determine all possible ordered pairs (a,b) which satisfy this relationship.

7. If $f(x)=2x-1$, determine all real values of "x" such that $(f(x))^2-3f(x)+2=0$

8. A function $f(x)$ has the following three properties:

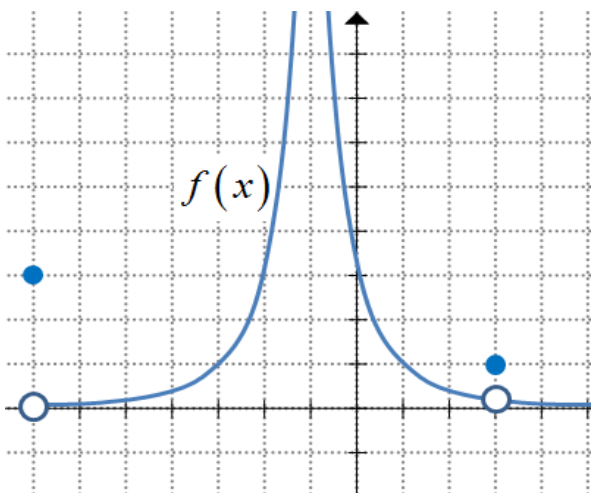i) $f(1)=1$, ii) $f(2x)=4f(x)+6$, iii) $f(x+2)=f(x)+12x+12$

Calculate the value of $f(6)$.

9. Given an example of a function $g(x)$ such that the identity below is true for all values of "x" and "y"

$$g(x+y)=g(x)+g(y)$$

10. Given the graph of $f(x)$, find the value of the following values:

$i)\, f(f(3))=$

$ii)\, f(f(0))=$

$iii)\, f(-1)$

$v)\, f(-7)\times f(0)$

$vi)\, f(f(x))=x$ $x=?$

$vi)\, f(f(f(-2)))$

11. Let $f(x) = 2^{kx} + 9$, where "k" is a real number. If $f(3):f(6) = 1:3$, determine the vale of $f(9) - f(3)$.

12. The function $f(x)$ has the property that $f(2x+3) = 2f(x)+3$ for all values of "x". If $f(0) = 6$, what is the value of $f(9)$?

13. Let $\phi(x)$ denote the sum of the digits of the positive integer "x" . For example, $\phi(8) = 8$ and $\phi(123) = 1+2+3$. For how many two digit value of "x" is $\phi(\phi(x)) = 3$?
    a) 3   b) 4   c) 6   d) 9   e) 10

14. For any three real numbers "a" , "b", and "c", with $b \neq c$, the operation ϖ is defined by:

    $\varpi(a,b,c) = \dfrac{a}{b-c}$. What is the value of $\varpi(\varpi(1,2,3),\varpi(2,3,1),\varpi(3,1,2))$?

15. In Circle Land, the numbers 207 and 4520 are shown in the following way . What number is represented by the following diagram on the right?

207   4520