First Name:_____ Last Name: _____ Student ID: _____

Functions: Transformations and Properties

1. For each relation given,

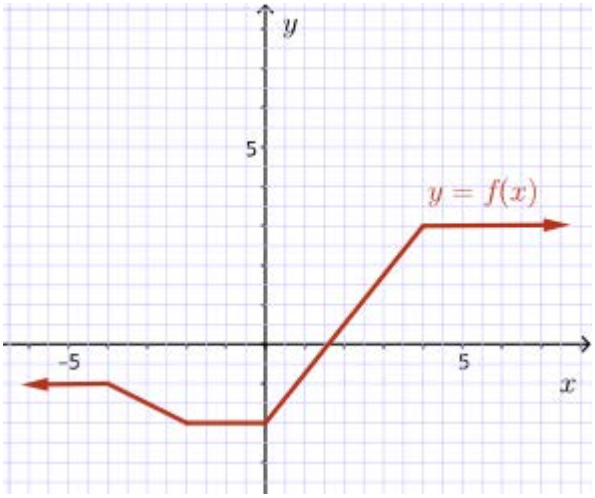
a. state the domain and range;

b. identify whether the relation is a function or not.

i. {(1,1),(2,1),(3,2),(4,3),(5,5),(6,8)}	ii. x = -2
iii. $y = (x+1)^2 - 2$	iv. $(x-1)^2 + y^2 = 9$
v. $y = -3\sqrt{x+2} + 5$	vi. $y = 2^{x-4} + 3$

2. If $f(x)=2x-3$ and $g(x)=6x^2+3x-18$, determine the value(s) of x such that $f(x)=g(x)$.

3. The graph of $y=f(x)$ is shown.



Determine the following:

a. the value of $f(0)$
b. the value of x such that $f(x)=0$
c. the value of $f(4)-f(-4)$
d. state the domain and range

4. Given $f(x)=(x-3)^2$ and $g(x)=4x+3$, determine in simplest form

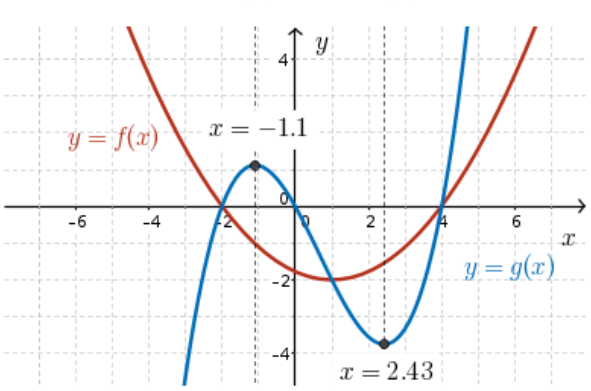
a. $f(x)-g(x)$ b. $2f(x)$ c. $f(x)g(x)$

d. $f(g(x))$ e. $g(g(x))$ f. $[g(x)]^2$

5. If $f(x)=5-2x+k$ and $f(f(k))=13$, determine the value of $f(-4)$.

6. If $g(x)=1-3x$ and $f(g(x))=9x^2-6x+5$, determine the value of $f(5)$.

7. Given the graphs of $y=f(x)$ and $y=g(x)$ as shown in the graph below



identify the following.

a. where $f(x)=g(x)$
b. the interval(s) where $g(x)<0$
c. the interval(s) where $f(x)\geq g(x)$
d. the interval(s) where both functions are decreasing.
e. the local maxima and minima for both functions

8. Solve. Write your answers using interval notation.

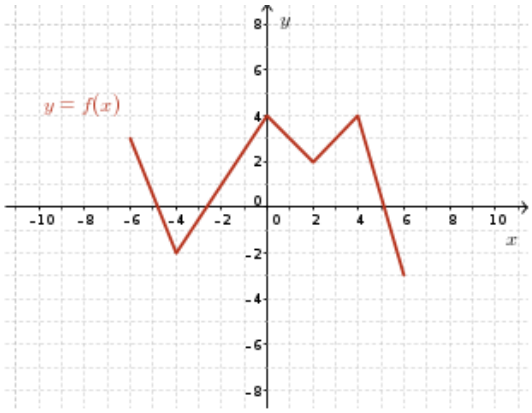
a. $-3 < \frac{2x+5}{3} \leq 5$

b. $\frac{3}{x-2} > 1$

c. $\frac{3x-6}{4x-8} \leq 1$

d. $x(x+3)(x-4) > 0$

9. Given the graph of the function $y=f(x)$, draw the graphs of the following transformed function $y= 2f(-(x-4))-2$:



10. The function $f(x)$ satisfies the equation $f(x)=f(x-1)+f(x+1)$ for all values of x. Define $f(1)=1$ and $f(3)=3$; then, $f(2)=1+3=4$. Determine the value of $f(1867)$.