Date Completed: _____
Mentor Initials: _____

Functions (Advanced)

Multiple Choice

1. The table of values for the two functions f and g are shown below. What is the value of $f(g(10))$?

x	$f(x)$
-5	10
-3	12
0	4
8	7

x	$g(x)$
-3	4
0	10
10	0
12	7

A) 0
B) 4
C) 10
D) 12

2. $$g(x) = 3^x - 3$$

The function g is defined by the equation above. Which of the following points in the xy-plane is a y-intercept of the graph of the equation $y = g(x)$?

A) $-3, g(-3)$
B) $-1, g(-1)$
C) $0, g(0)$
D) $1, g(1)$

3. Given that $h(x) = \frac{x-2}{x^2}$, which of the following expressions is equal to $h(x+2)$ for all x in its domain?

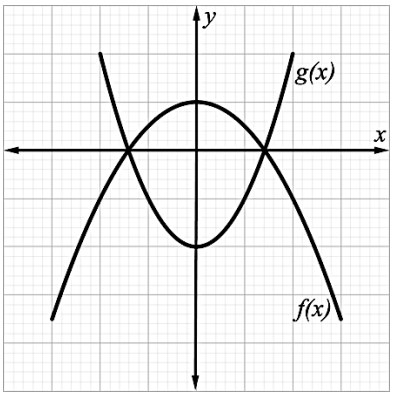
A) $\frac{x}{x^2+4}$

B) $\frac{x}{x^2+4x+4}$

C) $\frac{x+2}{x^2+4}$

D) $\frac{x+2}{x^2+4x+4}$

4. The graphs of $f(x) = -\frac{1}{2}x^2 + 1$ and $g(x) = x^2 - 2$ are shown below.



The graphs of f and g intersect at the points $(-k, 0)$ and $(k, 0)$. What is the value of k?

A) 1.5

B) 2

C) $\sqrt{2}$

D) $\sqrt{3}$

5. The function h has the property that if point (j, k) is on the graph of the equation $y = h(x)$ in the xy-plane, then the point $(j+1, 4k)$ is also on the graph. Which of the following could define h?

A) $h(x) = \frac{1}{4}(\frac{1}{15})^x$

B) $h(x) = 15(\frac{1}{4})^x$

C) $h(x) = 15(4)^x$

D) $h(x) = \frac{1}{4}(15)^x$

Grid-In

6. Two functions are defined as $f(x) = 2x^2 - 4$ and $g(x) = -x^2 + 8$. The graphs of f and g intersect at the points $(-k, 4)$ and $(k, 4)$. What is the value of k?

7. $$g(x) = kx^2 - 10x$$

For the function g above, k is a constant and $g(2) = 4$. What is the value of $g(-2)$?

8. The table of values for the two functions f and g are shown below. What is the value of $g(f(-3))$?

x	$f(x)$
-5	10
-3	12
0	4
8	7

x	$g(x)$
-3	4
0	10
10	0
12	7

9. The function g is defined by $g(q) = (q - 3)(q - 4)^2$. If $g(k - 2) = 0$, what is one possible value of k ?

10. $$g(x) = ax^2 + 12$$

For the function g defined above, a is a constant, and $g(2) = 20$. What is the value of $g(3)$?