FUNCTIONS I: Finding Function Values

Name Master Yoda

Date ______ Block ______

Given $f(x)=3x+2$**, find:**

1. $f(-2)$ $3(-2)+2$ $-6+2=-4$

2. $f\left(\frac{1}{2}\right)$ $3(\frac{1}{2})+2$ $1.5+2=3.5$

3. $f(2{,}000)$ $3(2000)+2=6002$

4. $f(k)$ $3(k)+2=3k+2$

5. $f(2a)$ $3(2a)+2=6a+2$

Given $g(x)=x^2-1$**, find:**

6. $g(-3)$ $(-3)^2-1=9-1=8$

7. $g\left(\frac{3}{4}\right)$ $\left(\frac{3}{4}\right)^2-1=\frac{9}{16}-\frac{16}{16}=\frac{-7}{16}$

8. $g(3b)$ $(3b)^2-1=9b^2-1$

Given $f(x)=\begin{cases} x^2 \text{ if } x>3 \\ 2x+1 \text{ if } x\le 3\end{cases}$**, find:**

9. $f(4)$ $(4)^2=16$

10. $f(2)$ $2(2)+1=4+1=5$

11. $f\left(\frac{1}{2}\right)$ $2(\frac{1}{2})+1=1+1=2$

12. $f\left(\frac{13}{4}\right)$ $\left(\frac{13}{4}\right)^2=\frac{169}{16}$

Given $F(x)=2^{x+3}$**, find:**

13. $F(1)$ $2^{1+3}=2^4=16$

14. $F(-5)$ $2^{-5+3}=2^{-2}=\frac{1}{2^2}=\frac{1}{4}$

15. $F(\pi)$ $2^{\pi+3}$

16. $F(k+2)$ $2^{k+2+3}=2^{k+5}$

Given $h(x)=\frac{1}{x}$**, find:**

17. $h\left(\frac{1}{2}\right)$ $\frac{1}{\frac{1}{2}}=2$

18. $h(-3)$ $\frac{1}{-3}=-\frac{1}{3}$

19. $h(.3)$ $\frac{1}{.3}=\frac{10}{3}$

The function $[x]$ **is defined as the greatest integer not exceeding x. It is sometimes called the "rounding down function."**

Given $g(x)=[x]$**, find:**

20. $g\left(\frac{5}{4}\right)$ $\left[\frac{5}{4}\right]=$ 1

21. $g(1.99)$ $[1.99]=$ 1

22. $g\left(-2\frac{1}{2}\right)$ $[-2\frac{1}{2}]=$ -3

23. $g(200)$ $[200]=200$

[integer] = integer!

FUNCTIONS II: Finding Function Values

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Given $F(x) = 2^{x+3}$, find:

1. $F(x-1)$ $2^{x-1+3} = 2^{x+2}$
2. $F(x^2+4)$ $2^{x^2+4+3} = 2^{x^2+7}$

Given $h(x) = 2x^2 + x - 4$, find:

3. $h(x^2)$ $2(x^2)^2 + (x^2) - 4 = 2x^4 + x^2 - 4$
4. $h(x+1)$ $2(x+1)^2 + (x+1) - 4 = 2(x^2+2x+1) + x + 1 - 4$
   $2x^2 + 4x + 2 + x - 3 = 2x^2 + 5x - 1$
5. $h(2^x)$ $2(2^x)^2 + 2^x - 4 = 2(2^{2x}) + 2^x - 4$
6. $h\left(\frac{1}{x}\right)$ $2\left(\frac{1}{x}\right)^2 + \frac{1}{x} - 4 = 2\left(\frac{1}{x^2}\right) + \frac{1}{x} - 4 = \frac{2}{x^2} + \frac{1}{x} - 4$

Given $f(x) = 3x + 2$ and $g(x) = x^2 - 1$, find:

7. $f(2x-5)$ $3(2x-5)+2 = 6x - 15 + 2 = 6x - 13$
8. $g(2x-5)$ $(2x-5)^2 - 1 = 4x^2 - 20x + 25 - 1 = 4x^2 - 20x + 24$
9. $f(x^2)$ $3(x^2) + 2 = 3x^2 + 2$
10. $g(x^2)$ $(x^2)^2 - 1 = x^4 - 1$
11. $f(2^x)$ $3(2^x) + 2$
12. $g(2^x)$ $(2^x)^2 - 1 = 2^{2x} - 1$
13. $f(g(2))$ $g(2) = 2^2 - 1 = 3$ $f(3) = 3(3) + 2 = 11$
14. $g(f(2))$ $f(2) = 3(2) + 2 = 8$ $g(8) = 8^2 - 1 = 63$
15. $f(g(k))$ $g(k) = k^2 - 1$ $f(k^2-1) = 3(k^2-1) + 2 = 3k^2 - 3 + 2 = 3k^2 - 1$
16. $g(f(2a))$ $f(2a) = 3(2a) + 2 = 6a + 2$ $g(6a+2) = (6a+2)^2 - 1$
    $36a^2 + 24a + 4 - 1$
    $36a^2 + 24a + 3$
17. $f(g(x))$ $g(x) = x^2 - 1$ $f(x^2-1) = 3(x^2-1) + 2$
    $3x^2 - 3 + 2 = 3x^2 - 1$
18. $g(f(x))$ $f(x) = 3x + 2$ $g(3x+2) =$
    $(3x+2)^2 - 1 = 9x^2 + 12x + 4 - 1$
    $9x^2 + 12x + 3$