Function Composition Practice Problems

Name Key

Period ____ Date ____

$f(x) = 3x + 2$; $g(x) = 4x - 1$

1. $f(g(x))$

$3(4x-1)+2$

$12x-3+2$

$\boxed{12x-1}$

2. $g(f(x))$

$4(3x+2)-1$

$12x+8-1$

$\boxed{12x+7}$

3. $f(g(2))$

$12(2)-1 = \boxed{23}$

$f(x) = x^2$; $g(x) = 2x - 5$

4. $f(g(x))$

$(2x-5)^2$

$(2x-5)(2x-5)$

$\boxed{4x^2-20x+25}$

5. $g(f(x))$

$2(x^2)-5$

$\boxed{2x^2-5}$

6. $g(f(2))$

$2(2)^2-5$

$8-5$

$\boxed{3}$

$f(x) = 2x^2 - 4x$; $g(x) = x^2$

7. $f(g(x))$

$2(x^2)^2-4(x^2)$

$\boxed{2x^4-4x^2}$

8. $g(f(x))$

$(2x^2-4x)^2$

$(2x^2-4x)(2x^2-4x)$

$\boxed{4x^4-16x^3+16x^2}$

9. $f(g(2))$

$2(2)^4-4(2)^2$

$32-16$

$\boxed{16}$

$f(x) = 3x - 4$; $g(x) = (x-1)^2$; $h(x) = 4x$

10. $h(g(f(x)))$

$4(3x-4-1)^2$

$4(3x-5)^2$

$4(3x-5)(3x-5)$

$4(9x^2-30x+25) = \boxed{36x^2-120x+100}$

11. $g(h(f(x)))$

$(4(3x-4)-1)^2$

$(12x-16-1)^2$

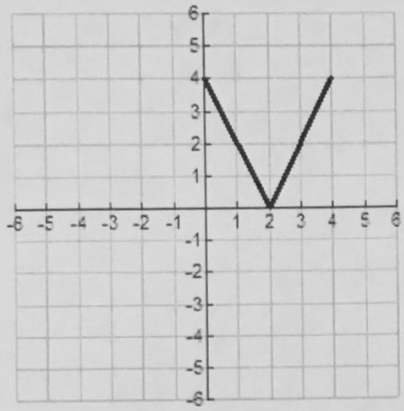
$(12x-17)^2$

$(12x-17)(12x-17)$

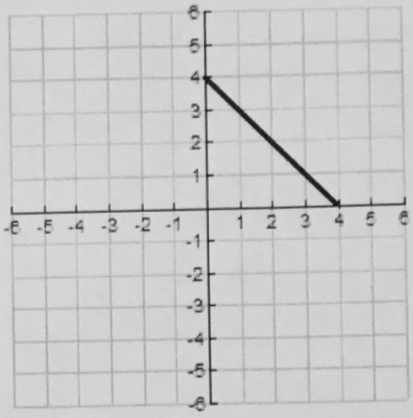
$\boxed{144x^2-408x+289}$

Use the graphs of f and g to evaluate the functions.

$y = f(x)$



$y = g(x)$



12. $(f+g)(3)$

$f(3) + g(3)$

$2 + 1$

$= \boxed{3}$

13. $(f/g)(2)$

$\frac{f(2)}{g(2)} = \frac{0}{2} = \boxed{0}$

14. $(f-g)(1)$

$f(1) - g(1)$

$2 - 3 = \boxed{-1}$

15. $(fg)(4)$

$f(4) \cdot g(4)$

$(4)(0) = \boxed{0}$

16. $(f \circ g)(2)$

$f(g(2))$

$= f(2)$

$= \boxed{0}$

17. $(g \circ f)(3)$

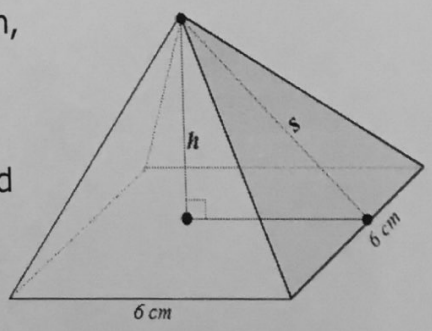
$g(f(3))$

$= g(2)$

$= \boxed{2}$

18. A pyramid is created from a square base where each side is 6 cm. The volume of the pyramid can be given by the function, $V(h) = 12h$.

The function to calculate the height of the same square based pyramid given the slant height could be described by $H(s) = \sqrt{s^2 - 9}$ where 's' is the slant height in cm.



a. Evaluate $V(H(5))$

$12\left(\sqrt{5^2 - 9}\right)$

$= \boxed{48\ cm^3}$

b. Explain what $V(H(5))$ represent

The volume of the square pyramid when the slant height is known to be 5 cm.