SM 3H

4.4 Composite Functions and Complex Fractions

2023-2024

SCORE: /

Name _____ Period _____ Date _____

Simplify.

1. $\dfrac{\frac{x}{5}}{\frac{4x}{5}}$

2. $\dfrac{\frac{1}{2}-\frac{1}{12}}{\frac{1}{2}+\frac{1}{12}}$

3. $\dfrac{\frac{2a}{3b^2}}{\frac{a}{b}}$

4. $\dfrac{2x+\frac{4x}{x-1}}{2x-\frac{4x}{x+1}}$

5. $\dfrac{\frac{1}{x}-\frac{1}{x^2-4}}{x-\frac{1}{x-2}}$

6. $\dfrac{1+\frac{5}{x^2}}{x+3}$

Evaluate each expression using the values given in the table.

7.

x	-3	-2	-1	0	1	2	3
$f(x)$	-7	-5	-3	-1	3	5	7
$g(x)$	8	3	0	-1	0	3	8

a) $(f \circ g)(1)$ b) $(f \circ g)(-1)$ c) $(g \circ f)(-1)$

d) $(g \circ f)(0)$ e) $(g \circ g)(-2)$ f) $(f \circ f)(-1)$

Evaluate each expression using the graphs of $y = f(x)$ and $y = g(x)$ shown in the figure.

8. a) $(g \circ f)(1)$

b) $(g \circ f)(5)$

c) $(f \circ g)(0)$

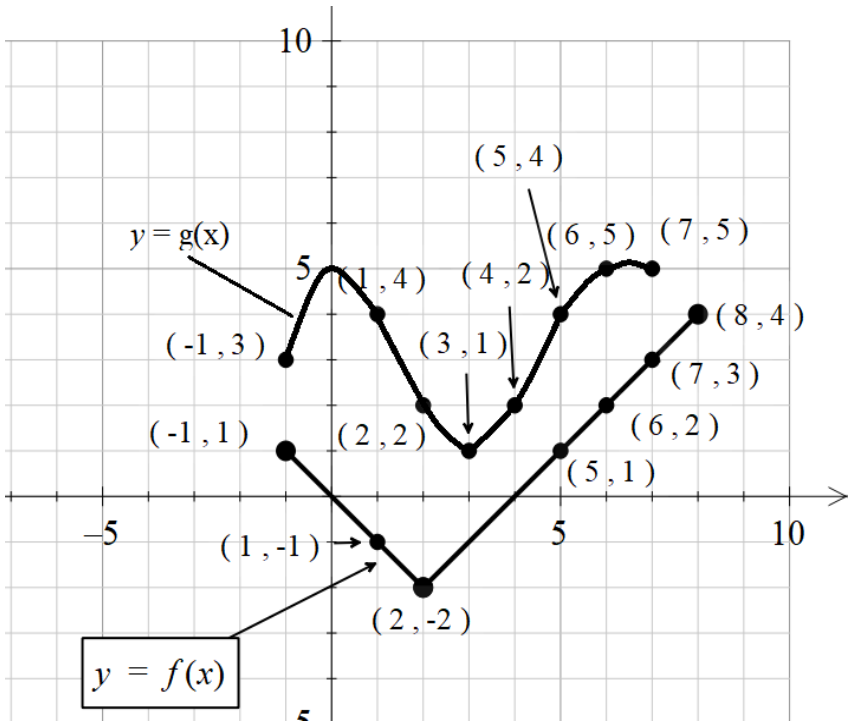
d) $(f \circ g)(2)$

e) $(f \circ g)(-1)$

f) $(f \circ g)(4)$

g) $(g \circ f)(0)$

h) $(g \circ f)(-1)$



Find the indicated composition function and its domain, using the given functions. Show work!

9. $f(x) = 3x + 2$ $g(x) = x - 1$

$a)$ $h(x) = (f \circ g)(x)$

$b)$ $h(x) = (g \circ f)(x)$

$c)$ $h(x) = (f \circ f)(x)$

$d)$ $h(x) = (g \circ g)(x)$

10 $f(x) = x^2 - 1$ $g(x) = \frac{1}{x-1}$

$a)$ $h(x) = (f \circ g)(x)$

$b)$ $h(x) = (g \circ f)(x)$

$c)$ $h(x) = (f \circ f)(x)$

$d)$ $h(x) = (g \circ g)(x)$

11. $f(x) = \frac{1}{x-1}$ $g(x) = \sqrt{x}$

$a)$ $h(x) = (f \circ g)(x)$

$b)$ $h(x) = (g \circ f)(x)$

$c)$ $h(x) = (f \circ f)(x)$

$d)$ $h(x) = (g \circ g)(x)$

Evaluate each composition function using the given functions.

$f(x)=3x^2-1$ $\quad$ $g(x)=\sqrt{x-1}$ $\quad$ $h(x)=\dfrac{x-2}{x-3}$

12. $(f\circ g)(1)$ $\quad$ 13. $(g\circ f)(5)$ $\quad$ 14. $(h\circ f)(4)$

15. $(g\circ g)(26)$ $\quad$ 16. $(f\circ f)(-1)$ $\quad$ 17. $(h\circ h)(4)$

18. If $f(x)=2x^2+5$ and $g(x)=3x+a$, find a so that the graph of $f\circ g$ crosses the $y-$axis at 23.

Review

Solve each equation for the specified variable.

19. $\dfrac{l}{T^2}=\dfrac{g}{4\pi^2}$, solve for T $\quad$ 20. $\dfrac{r_1}{r_2}=\sqrt{\dfrac{M_2}{M_1}}$, solve for M_1