Name Key Date

LESSON 6.3

Let $f(x) = 7x^{1/2} - 2$, $g(x) = -x^{1/2} + 4$, and $h(x) = -4x^{1/2} + 1$. Perform the indicated operation.

1. $f(x) + g(x) = (7x^{\frac{1}{2}} - 2) + (-x^{\frac{1}{2}} + 4) = \boxed{6x^{\frac{1}{2}} + 2}$

3. $h(x) + g(x) = (-4x^{\frac{1}{2}} + 1) + (-x^{\frac{1}{2}} + 4) = \boxed{-5x^{\frac{1}{2}} + 5}$

4. $f(x) - g(x) = (7x^{\frac{1}{2}} - 2) - (-x^{\frac{1}{2}} + 4) = \boxed{8x^{\frac{1}{2}} - 6}$

6. $g(x) - h(x) = (-x^{\frac{1}{2}} + 4) - (-4x^{\frac{1}{2}} + 1) = \boxed{3x^{\frac{1}{2}} + 3}$

Let $f(x) = 4x^2$, $g(x) = -3x^{4/3}$, and $h(x) = x^{1/2}$. Perform the indicated operation. And state the domain

7. $f(x) \cdot g(x) = (4x^2)(-3x^{\frac{4}{3}}) = \boxed{-12x^{\frac{10}{3}}, (-\infty, +\infty)}$

9. $h(x) \cdot g(x) = (x^{\frac{1}{2}})(-3x^{\frac{4}{3}}) = \boxed{-3x^{\frac{11}{6}}, (-\infty, +\infty)}$

10. $\dfrac{f(x)}{g(x)} = \dfrac{4x^2}{-3x^{\frac{4}{3}}} = \boxed{\dfrac{-4x^{\frac{2}{3}}}{3}} \boxed{(-\infty, 0) \cup (0, +\infty)}$

12. $\dfrac{h(x)}{g(x)} = \dfrac{x^{\frac{1}{2}}}{-3x^{\frac{4}{3}}} = \boxed{\dfrac{-1}{3x^{\frac{5}{6}}} \quad (-\infty, 0) \cup (0, +\infty)}$

Let $f(x) = 2x + 3$, $g(x) = \dfrac{3}{x + 1}$, and $h(x) = \dfrac{x + 5}{2}$. Perform the indicated operation. And state the domain

13. $f(g(x)) = 2\left(\dfrac{3}{x+1}\right) + 3 = \boxed{\dfrac{6}{x+1} + 3} \boxed{(-\infty, -1) \cup (-1, +\infty)}$

15. $f(h(x)) = 2\left(\dfrac{x+5}{2}\right) + 3 = x + 5 + 3 = \boxed{x + 8, (-\infty, +\infty)}$

17. $h(f(x)) = \dfrac{(2x+5)+5}{2} = \dfrac{2x+10}{2} = \boxed{x+5} \boxed{(-\infty, +\infty)}$

Let $f(x) = 3x + 2$, $g(x) = 2x^2$, and $h(x) = \dfrac{-4}{x + 3}$. State the domain of the operation.

19. $f(x) + g(x) = (3x+2) + (2x^2) = \boxed{2x^2 + 3x + 2, (-\infty, +\infty)}$

21. $h(x) \cdot g(x) \left(\dfrac{-4}{x+3}\right)(2x^2) = \boxed{\dfrac{-8x^2}{x+3}, (-\infty, -3) \cup (-3, +\infty)}$

23. $h(g(x)) = \dfrac{-4}{(2x^2)+3} = \dfrac{-4}{2x^2+3}, (-\infty, +\infty)$

There is No way $2x^2 + 3 = 0$, so there is not a restriction on Domain.

Name Key Date

LESSON 6.4

Find an equation for the inverse relation.

1. $y = 2x + 1$

$x = 2y + 1$

$x - 1 = 2y$

$\boxed{\frac{x-1}{2} = y}$

5. $y = \frac{1}{2} - \frac{2}{3}x$

$x = \frac{1}{2} - \frac{2}{3}y$

$-\frac{3}{2}\left(x - \frac{1}{2}\right) = \left(-\frac{2}{3}y\right)\left(-\frac{3}{2}\right)$

$\boxed{-\frac{3}{2}x + \frac{3}{4} = y}$

6. $y = x^2 + 2$

$x = y^2 + 2$

$x - 2 = y^2$

$\boxed{\pm\sqrt{x-2} = y}$

Verify that *f* and *g* are inverse functions.

10. $f(x) = 2x - 4$; $g(x) = \frac{1}{2}x + 2$

$f(g(x)) = 2\left(\frac{1}{2}x + 2\right) - 4$
$= x + 4 - 4$
$= x$ ✓

$g(f(x)) = \frac{1}{2}(2x - 4) + 2$
$= x - 2 + 2$
$= x$

11. $f(x) = 3 - x$; $g(x) = 3 - x$

$f(g(x)) = 3 - (3 - x)$
$= 3 - 3 + x$
$= x$ ✓

$g(f(x)) = 3 - (3 - x)$
$= 3 - 3 + x$
$= x$

12. $f(x) = x^2 + 5, x \geq 0$; $g(x) = \sqrt{x - 5}$

$f(g(x)) = (\sqrt{x-5})^2 + 5$

$f(g(x)) = x - 5 + 5$

$f(g(x)) = x$ ✓

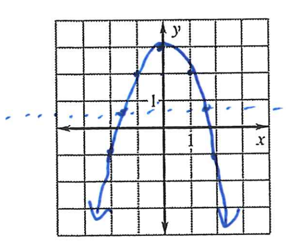
$g(f(x)) = \sqrt{(x^2+5)} - 5$

$g(f(x)) = \sqrt{x^2}$

$g(f(x)) = x$

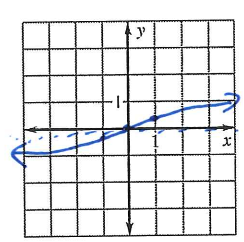
Graph the function *f*. Then use the horizontal line test to determine whether the inverse of *f* is a function.

16. $f(x) = -x^2 + 3, x \geq 0$



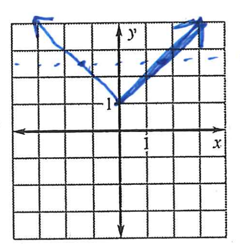
No, HLT fails

17. $f(x) = \frac{1}{4}x^3$



Yes, Passes HLT

18. $f(x) = |x| + 1$



No, HLT Fails