Answers

Lesson Summary

COMPOSITION OF A FUNCTION AND ITS INVERSE: To verify that two functions are inverses, show that $f(g(x)) = x$ and $g(f(x)) = x$.

INVERTIBLE FUNCTION: The domain of a function f can be restricted to make it invertible.
A function is said to be invertible if its inverse is also a function.

Verify that each of the function pairs are inverses.

9. $f(x) = -\frac{7}{2}x - 3, \quad g(x) = -\frac{2x+6}{7}$

$f(g(x)) = -\frac{7}{2}\left[-\frac{2x+6}{7}\right] - 3 = \frac{\cancel{7}}{2} \cdot \frac{2x+6}{\cancel{7}} - 3 = \frac{2x+6}{2} - 3 = x+3-3 = x$

$g(f(x)) = -\frac{2(-\frac{7}{2}x-3)+6}{7} = -\frac{-7x-6+6}{7} = -\frac{-7x}{7} = x$

Inverses

10. $f(x) = \frac{x-9}{4}, \quad g(x) = 4x + 9$

$f(g(x)) = \frac{4x+9-9}{4} = \frac{4x}{4} = x$

$g(f(x)) = 4\left(\frac{x-9}{4}\right) + 9 = x - 9 + 9 = x$

Inverses

11. $f(x) = x^3 + 5, \quad g(x) = \sqrt[3]{x-5}$

$f(g(x)) = \left(\sqrt[3]{x-5}\right)^3 + 5 = x - 5 + 5 = x$

$g(f(x)) = \sqrt[3]{(x^3+5)-5} = \sqrt[3]{x^3+5-5} = \sqrt[3]{x^3} = x$

Inverses

HW: Finish the Khan Modules Online