BRONX COMMUNITY COLLEGE

of The City University of New York

DEPARTMENT OF MATHEMATICS and COMPUTER SCIENCE

CSI30: Chapters 2 and 3 Review

Here are the solutions/answers to the last three problems:

8) Determine the domain, the codomain/target, and the range of the function $f(x) = x^2+3$

Answer:

domain: R (set of all real numbers)

codomain/target: R (set of all real numbers)

range: $\{y \in R |\ y \geq 3\}$ (i.e. the set of all real numbers greater than or equal to 3)

9) Find $f \circ g$ and $g \circ f$, where $f(x) = 2x$ and $g(x) = 3x + 5$, are functions from **R** to **R**.

Answer: $f \circ g = f(g(x)) = f(3x + 5) = 2(3x + 5) = 6x + 10$

$g \circ f = g(f(x)) = g(2x) = 3(2x) + 5 = 6x + 5$

10) Is function $g(x) = x^3 - 4$ invertible? If yes, explain why and find its inverse function. If no, provide explanations also.

Solution:

the function is *one-to-one* (i.e. no two different x-values are mapped to the same y-value), hence it is invertible. Let's find the inverse function $g^{-1}(x)$:

$y = x^3 - 4$ - let's solve it for x: $x = \sqrt[3]{y + 4}$

Therefore, $g^{-1}(x) = \sqrt[3]{x + 4}$