



PROBLEMS AND SOLUTIONS - INVERSE ALGEBRAIC FUNCTIONS
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PLEASE NOTE THAT YOU CANNOT ALWAYS USE A CALCULATOR ON THE ACCUPLACER - COLLEGE-LEVEL MATHEMATICS TEST! YOU MUST BE ABLE TO DO SOME PROBLEMS WITHOUT A CALCULATOR!

Problem 1:

Given the *one-to-one* function $y = \sqrt{x-2}$ with domain $x \geq 2$ and range $y \geq 0$, find $f^{-1}(x)$ with its domain and range.

Problem 2:

Given the *one-to-one* function $f(x) = \sqrt[3]{x-5}$ with domain and range consisting of **All Real Numbers**, find $f^{-1}(x)$ with its domain and range.

Problem 3:

Given the *one-to-one* function $f(x) = 3x - 2$ with the domain and range consisting of **All Real Numbers**, find $f^{-1}(x)$ with its domain and range.

Problem 4:

Given the *one-to-one* function $f(x) = \frac{2x-3}{x+4}$ with domain $\{x \mid x \neq -4\}$ and range $\{y \mid y \neq 2\}$, find $f^{-1}(x)$ with its domain and range.

Problem 5:

Given the *one-to-one* function $g(x) = \frac{4x}{5x-9}$ with domain $\{x \mid x \neq \frac{9}{5}\}$ and range $\{y \mid y \neq \frac{4}{5}\}$, find $g^{-1}(x)$ with its domain and range.

Problem 6:

Given the *one-to-one* function $g(x) = \frac{1}{x}$ with domain $\{x \mid x \neq 0\}$ and range $\{y \mid y \neq 0\}$, find $g^{-1}(x)$ with its domain and range.

Problem 7:

Show that the functions f and g are inverses of each other.

Problem 8:

Show that the functions f and g are **NOT** inverses of each other.

Problem 9:

Given the *one-to-one* function $f(x) = 5 - x$ with the domain and range consisting of **All Real Numbers**, find $f^{-1}(0)$.


SOLUTIONS

You can find detailed solutions below the link for this problem set!

1. $f^{-1}(x) = x^2 + 2$ with a domain of $\{x \mid x \geq 0\}$ and a range of $\{y \mid y \geq 2\}$	2. $f^{-1}(x) = x^3 + 5$ with a domain and range consisting of All Real Numbers	3. $f^{-1}(x) = \frac{x+2}{3} = \frac{1}{3}x + \frac{2}{3}$ with a domain and range consisting of All Real Numbers
4. $f^{-1}(x) = \frac{-4x-3}{x-2}$ with domain $\{x \mid x \neq 2\}$ and range $\{y \mid y \neq -4\}$	5. $g^{-1}(x) = \frac{9x}{5x-4}$ with domain $\{x \mid x \neq \frac{4}{5}\}$ and range $\{y \mid y \neq \frac{9}{5}\}$	6. $g^{-1}(x) = \frac{1}{x}$ with domain $\{x \mid x \neq 0\}$ and range $\{y \mid y \neq 0\}$
7. $f[g(x)] = x$ and $g[f(x)] = x$	8. $f[g(x)] \neq x$	9. $f^{-1}(0) = 0 + 5 = 5$