1.4 Building Functions from Functions

Target 1C: Build functions from functions (using sum, difference, multiplication, division, composition, & inverse)

Review of Prior Concepts

Solve for y.

1. $x = 3y - 6$ **2.** $x = y^2 + 4$ **3.** $x = \frac{y-2}{y+3}$

More Practice

Solving Equations for a Variable

http://www.virtualnerd.com/algebra-1/linear-equations-solve/isolate-variables-formulas-examples/isolate-variable/isolate-variables-in-terms-of-variables

http://tutorial.math.lamar.edu/Classes/Alg/SolveMultiVariable.aspx

https://www.youtube.com/watch?v=bjJeyedQLIQ

SAT Connection

Passport to Advanced Math

2. Determine the most suitable form of an expression or equation to reveal a particular trait.

Example:

$$a = 1{,}052 + 1.08t$$

The speed of a sound wave in air depends on the air temperature. The formula above shows the relationship between a, the speed of a sound wave, in feet per second, and t, the air temperature, in degrees Fahrenheit (°F).

Which of the following expresses the air temperature in terms of the speed of a sound wave?

A) $t = \frac{a - 1{,}052}{1.08}$

B) $t = \frac{a + 1{,}052}{1.08}$

C) $t = \frac{1{,}052 - a}{1.08}$

D) $t = \frac{1.08}{a + 1{,}052}$

Solution

Operations on Functions

- Sum
- Difference
- Product
- Quotient
- Composition

Example 1:
If $f(x) = x^2 + 3$ and $g(x) = x - 1$, state the domain of $f(x)$ and $g(x)$. Then, find and state the domain of each:

$(f + g)(x)$

$(f - g)(x)$

$(fg)(x)$

$(f/g)(x)$

$(f\ o\ g)(x)$

$(g\ o\ f)(x)$

Example 2:
If $f(x) = \sqrt{3-x}$ and $g(x) = 2x + 8$, state the domain of $f(x)$ and $g(x)$. Then, find and state the domain of each:

$(f + g)(x)$

$(f - g)(x)$

$(fg)(x)$

$(f/g)(x)$

$(f \ o \ g)(x)$

$(g \ o \ f)(x)$

More Practice

Operations on Functions
http://www.algebralab.org/lessons/lesson.aspx?file=Algebra_FunctionsRelationsOperations.xml
https://www.mathsisfun.com/sets/functions-operations.html
https://www.khanacademy.org/math/algebra2/manipulating-functions/combining-functions/a/introduction-to-combining-functions
http://www.regentsprep.org/regents/math/algtrig/ATP7/compositionfunctions.htm

Homework Assignment
p.127 #1,3,4,5,7,9,11,14,17,19

SAT Connection

Solution

Choice A is correct. Subtracting 1,052 from both sides of the equation $a = 1{,}052 + 1.08t$ gives $a - 1{,}052 = 1.08t$. Then dividing both sides of $a - 1{,}052 = 1.08t$ by 1.08 gives $t = \frac{a - 1{,}052}{1.08}$.

Choices B, C, and D are incorrect and could arise from errors in rewriting $a = 1{,}052 + 1.08t$. For example, choice B could result if 1,052 is added to the left side of $a = 1{,}052 + 1.08t$ and subtracted from the right side, and then both sides are divided by 1.08.