

Precalculus - Combining and Composing Functions - Worksheet

Common Core F-BF.A.1b, F-BF.A.1c · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

These 20 problems practice combining and composing functions (Common Core F-BF.A.1b and F-BF.A.1c). You will evaluate sums, products and composites, find domains, decompose functions and solve model problems.

Precalculus · Common Core State Standards: **F-BF.A.1b, F-BF.A.1c**

Exercise 1 - Sum of functions at a point

Let $f(x) = 3x - 2$ and $g(x) = x^2 + 1$. Find $(f + g)(2)$.

Exercise 2 - Difference of functions

For the same f and g , write $(f - g)(x)$ in simplest form.

Exercise 3 - Product of functions

For the same f and g , write $(fg)(x)$ in standard form.

Exercise 4 - Domain of a quotient

Let $f(x) = x + 1$ and $g(x) = x^2 - 4$. Find the domain of $\left(\frac{f}{g}\right)(x)$.

Exercise 5 - Evaluate f of g

With $f(x) = 3x - 2$ and $g(x) = x^2 + 1$, find $f(g(2))$.

Exercise 6 - Evaluate g of f

With the same functions, find $g(f(2))$.

Exercise 7 - Composition from a table

x	0	1	2	3
f(x)	2	5	1	4
g(x)	3	0	2	1

Table for f and g .

Use the table to find $f(g(1))$, $g(f(0))$ and $f(g(3))$.

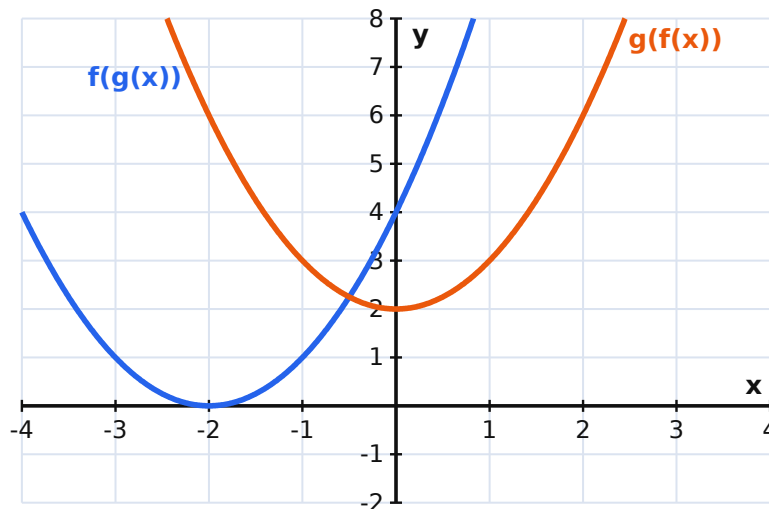
Exercise 8 - Composite formula

Let $f(x) = 2x + 3$ and $g(x) = x^2 - 1$. Write $(f \circ g)(x)$ in simplest form.

Exercise 9 - Composite in the other order

For the same f and g , write $(g \circ f)(x)$ in standard form.

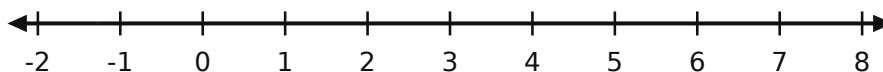
Exercise 10 - Order matters



$$y = (x+2)^2 \text{ and } y = x^2 + 2.$$

Let $f(x) = x + 5$ and $g(x) = 3x$. Show that $f(g(x)) \neq g(f(x))$.

Exercise 11 - Domain of a composite



Number line for the domain.

Let $f(x) = \sqrt{x}$ and $g(x) = x - 4$. Find the domain of $f(g(x))$.

Exercise 12 - Two composites with a reciprocal

Let $f(x) = \frac{1}{x}$ and $g(x) = x - 3$. Write $f(g(x))$ and $g(f(x))$, and give each domain.

Exercise 13 - Domain with a square root inside

Let $f(x) = \sqrt{x}$ and $g(x) = x^2 - 9$. Find the domain of $f(g(x))$.

Exercise 14 - Decompose a power

Write $h(x) = (5x - 1)^4$ as $f(g(x))$ with simple functions f and g .

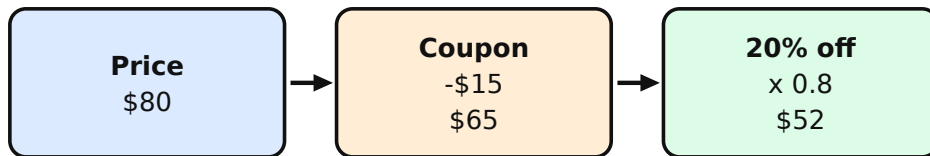
Exercise 15 - Decompose a root

Write $h(x) = \sqrt{x^2 + 7}$ as $f(g(x))$.

Exercise 16 - Three functions

Let $f(x) = x + 1$, $g(x) = 2x$ and $h(x) = x^2$. Find $f(g(h(3)))$.

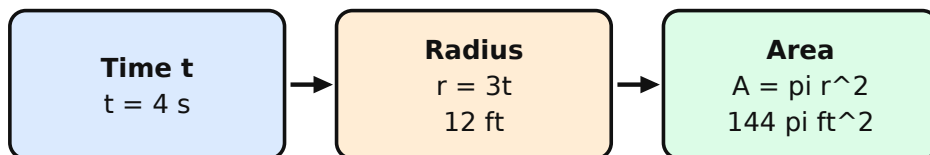
Exercise 17 - Coupon and discount



Coupon first, then 20% off.

Aisha buys a jacket priced \$80. A coupon takes \$15 off, and a sale takes 20% off. Let $c(p) = p - 15$ and $s(p) = 0.8p$. Find $s(c(80))$ and $c(s(80))$. Which order is cheaper?

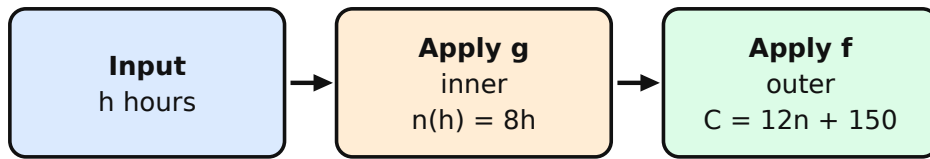
Exercise 18 - Spreading ripple



Time to radius to area.

A ripple spreads so its radius is $r(t) = 3t$ feet after t seconds. The area is $A(r) = \pi r^2$. Write $A(r(t))$, then find the area at $t = 4$ seconds to the nearest tenth.

Exercise 19 - Bakery cost model



Hours to shirts to cost.

A Little League booster club prints $n(h) = 8h$ shirts in h hours. The cost is $C(n) = 12n + 150$ dollars. Write $C(n(h))$, find the cost for 6 hours, and find the hours for a cost of \$1,206.

Exercise 20 - Verify two functions undo each other

Let $f(x) = \frac{x-5}{2}$ and $g(x) = 2x+5$. Show that $f(g(x)) = x$ and $g(f(x)) = x$.