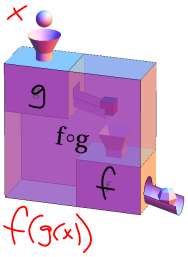
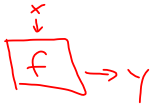
Composition of Functions II (10.3)

p507 day 3

hw: p287#14,15,16



f(g(x))



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ex1: Find $f \circ g$ and $g \circ f$ if

f(x)={(1,2), (3,6), (4,10), (5,2)}

g(x)={(1,6), (2,4), (3,5), (6,3)}

$f \circ g =$ {(2,10), (3,2), (6,6)}

f(g(x))

3 x 4 f x y

(2,4) → (9,10)

(2,10)

the range of g is the domain of f

(3,5) → (5,2)

(3,2)

$g \circ f =$ {(1,4), (3,6), (5,4)}

g(f(x))

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ex2: Find $f \circ g$ and $g \circ f$ if

f(x)={(1,1), (2,4), (3,9), (4,16)}

g(x)={(0,2), (1,3), (2,4), (3,5), (4,6)}

$f \circ g =$ {(0,4), (1,9), (2,16)}

$g \circ f =$ {(1,3), (2,6)}

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11. A manufacturer of lawn chairs models the weekly production of chairs since 2009 by the function $C(t) = 100 + 35t$, where t is the time, in years, since 2009 and C is the number of chairs. The size of the workforce at the manufacturer's site is modelled by $W(C) = 3\sqrt{C}$.

a) Write the size of the workforce as a function of time. W(t)

b) State the domain and range of the new function in this context.

note: we have workforce as a function of chairs, and chairs as a function of time

we compose to get workforce as a function of time

a) W(t) = W(C(t))

$= 3\sqrt{100 + 35t}$

13.

4/100km $/L

$/100km

Composition of Functions II (10.3)

p507 day 3

14. Use the functions $f(x) = 3x$, $g(x) = x - 7$, and $h(x) = x^2$ to determine each of the following.

a) $(f \circ g \circ h)(x)$ = $3(x^2 - 7)$

b) $g(f(h(x)))$ = $3(x^2) - 7$

c) $f(h(g(x)))$ = $3(x-7)^2$

d) $(h \circ g \circ f)(x)$ = $((3x) - 7)^2$

Composition of Functions II (10.3) p507 day 3

hw: p507#12
p159#11, 16, 18

12. Tobias is shopping at a local sports store that is having a 25%-off sale on apparel. Where he lives, the federal tax adds 5% to the selling price.

a) Write the function, $s(p)$, that relates the regular price, p, to the sale price, s, both in dollars.

$s(p) = 0.75p$

b) Write the function, $t(s)$, that relates the sale price, s, to the total cost including taxes, t, both in dollars.

$t(s) = 1.05s$

c) Write a composite function that expresses the total cost in terms of the regular price. How much did Tobias pay for a jacket with a regular price of $89.99?

$t(p) = t(s(p))$
$= 1.05(0.75p)$
$t(p) = 0.7875p$