



Math122 College Algebra

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3.6

Combining Functions

- Let f and g be functions with domain A and B respectively.
 - $f + g$ is $(f + g)(x) = f(x) + g(x)$ with domain $A \cap B$
 - $f - g$ is $(f - g)(x) = f(x) - g(x)$ with domain $A \cap B$
 - $f \cdot g$ is $(fg)(x) = f(x)g(x)$ with domain $A \cap B$
 - $\frac{f}{g}$ is $\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)}$ with domain $A \cap B$ and $g(x) \neq 0$

Problem

- Let $f(x) = \frac{1}{x-1}$ and $g(x) = \sqrt{x+1}$, find
 - $f + g$
 - the domain of $f + g$
 - $(f + g)(3)$

Problem

- Let $f(x) = \frac{1}{x-1}$ and $g(x) = \sqrt{x+1}$, find
 - $f - g$
 - the domain of $f - g$
 - $(f - g)(3)$

Problem

- Let $f(x) = \frac{1}{x-1}$ and $g(x) = \sqrt{x+1}$, find

➤ fg

➤ the domain of fg

➤ $(fg)(3)$

Problem

- Let $f(x) = \frac{1}{x-1}$ and $g(x) = \sqrt{x+1}$, find
 - f/g
 - the domain of f/g
 - $(f/g)(3)$

Composition of Functions

- Given two functions f and g , the composite function $f \circ g$ read “f-compose-g” is
 $(f \circ g)(x) = f(g(x))$
- Notice the output of g is the input of f
- Draw a diagram that shows how the composition of functions works with x as the input

Problem

- Let $f(x) = x^2$ and $g(x) = x - 3$, find
 - $(f \circ g)(x)$
 - $(f \circ g)(5)$
 - $(g \circ f)(x)$
 - $(g \circ f)(7)$