

MTH 30 LECTURE NOTES (Ojakian)
Topic 4: Function Arithmetic and Composition

OUTLINE
(References: 1.4)

1. Arithmetic operations, etc on functions
 2. Function Composition
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1. Set Intersection

- (a) Intersecting finite sets.
- (b) Intersecting intervals.

2. Four Arithmetic Operations

- (a) Add and subtract and multiply and divide
- (b) Problems
 - i. 1.4: 7
 - ii. Make up a table for f and g , then compute
- (c) Domain: Intersection of domains.

3. Function Composition

- (a) Do f then g : 2 notations - $g(f(x))$ or $g \circ f$
- (b) Problem: Do on last table (note issues of finding domain)
- (c) Problem: Student's draw 2 graphs then find compositions (note issue of finding domain)
- (d) Problem: 1.4: 13 (and do if lose +3)
- (e) Interpretation 1.4 - examples 3, 4

4. Domain With Function Composition

- (a) Finding the domain of $f(g(x))$.
 - i. Find the domain of g . Call it G .
 - ii. Find domain of f . Call it F .
 - iii. Call a value x of G bad if $g(x)$ is not in F .
 - iv. Domain of $f(g(x))$: G with all the bad values excluded.
- (b) Alternate approach with algebraic definitions.
 - i. Write down the composition.
 - ii. But do not simplify anything!
 - iii. Find the domain of the resulting expression.
- (c) Decomposing one function into two functions.
Section 1.4. Example 10.
- (d) Problems. Section 1.4: 21
- (e) Problems. Section 1.4: 27, 34