Lesson 11

Read Chapter 8

Composition

What is a function ?

g(f(x)) in pictures

Example $f(x) = x^2 + 1$, $g(x) = 2x + 3$

$g(f(x)) =$

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Example $f(x) = \begin{cases} x+1 & \text{if } x \leq 0 \\ 2x^2 + x + 1 & \text{if } x > 0 \end{cases}$ $g(x) = 2x + 3$

$g(f(x)) =$

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Write the following functions as composition of two functions:

e^{x^3}

$\sqrt{x^3 + 1}$

Domain of $g(f(x))$

Range of $g(f(x))$

Suppose $g(x)$ has domain $-5 \leq x \leq 6$ and range $1 \leq y \leq 10$
What are the domain and range of $g(4x - 5)$?

Suppose $g(x)$ has domain $-5 \leq x \leq 6$ and range $1 \leq y \leq 10$
What are the domain and range of $4g(x) - 5$?

Suppose $h(t) = |t|$ find a formula for $h(h(t) - 2)$ and graph $h(h(t) - 2)$

Suppose $f(x)$ is the profit made by selling x barrels of apples and $g(x)$ is the number of barrels of apples produced by x trees. Explain in words the meaning of $f(g(x))$