12 Decomposition of Functions

Idea: Take a function and rewrite it as a composition. This is the reverse process for computing the composition.

Eg: ① $y(x) = (x^2+1)^5$

$f(x) = x^5$

$g(x) = x^2+1$

$y = f \circ g$

② $y(x) = \cos^3(x)$

$f(x) = x^3$ $\quad y = f \circ g$

$g(x) = \cos(x)$

③ $y = \tan(\sqrt{x})$

$f(x) = \tan(x)$ $\quad y = f \circ g$

$g(x) = \sqrt{x}$

④ $y(x) = \cos(\sqrt{x^2+1})$

$f(x) = \cos(x)$ $\quad y = f \circ g \circ h$

$g(x) = \sqrt{x}$

$h(x) = x^2+1$