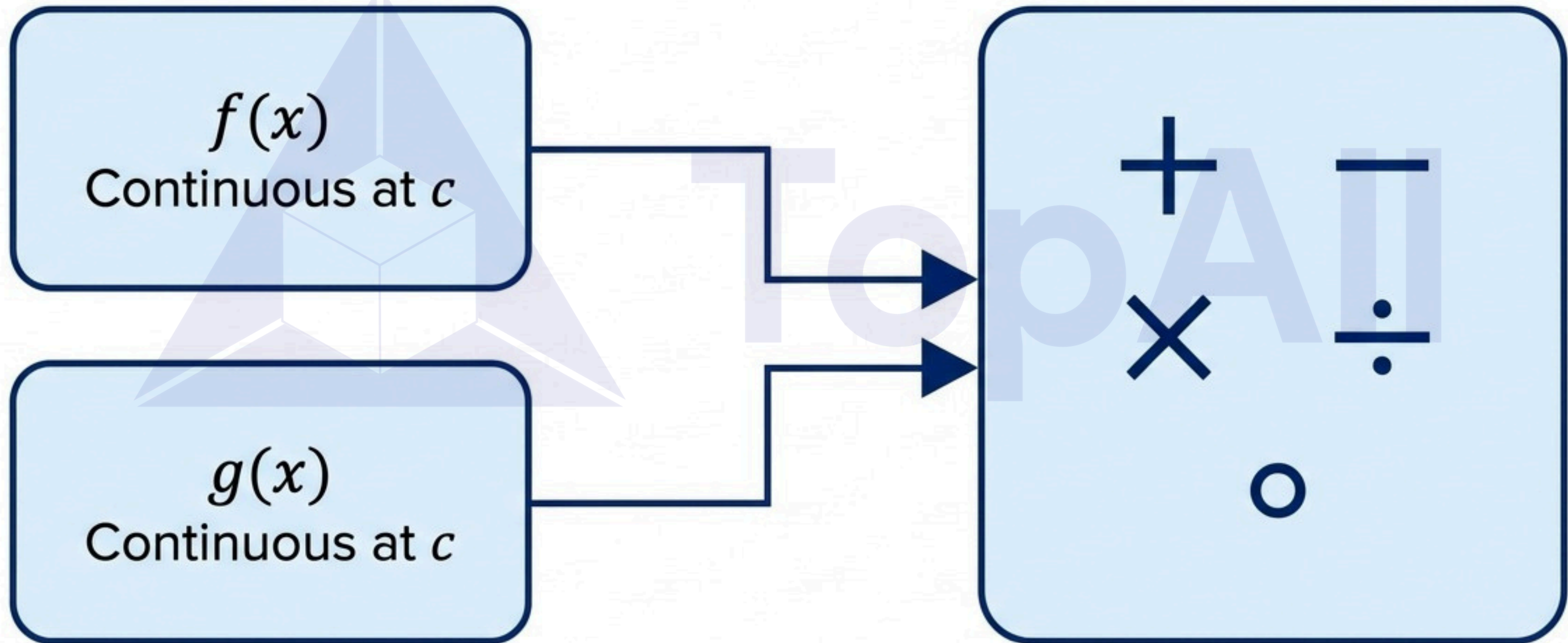


Algebra of Continuous Functions

Use known continuous functions to build new ones



What Remains Continuous?

$$f + g$$

✓ Continuous

$$f - g$$

✓ Continuous

$$fg$$

✓ Continuous

$$f/g$$

✓ Continuous
only if $g(c) \neq 0$

The Logic Comes From Limits



$$\lim_{x \rightarrow c} (f + g)(x)$$

$$= \lim_{x \rightarrow c} [f(x) + g(x)]$$

Definition

$$= \lim_{x \rightarrow c} f(x) + \lim_{x \rightarrow c} g(x)$$

Limit law

$$= f(c) + g(c)$$

Continuity

$$= (f + g)(c)$$



You've Learned the Theory. Let's Test Them Now.

$$E=mc^2$$



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- » Get Clear Explanations, Not Just Marks
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A Powerful Shortcut

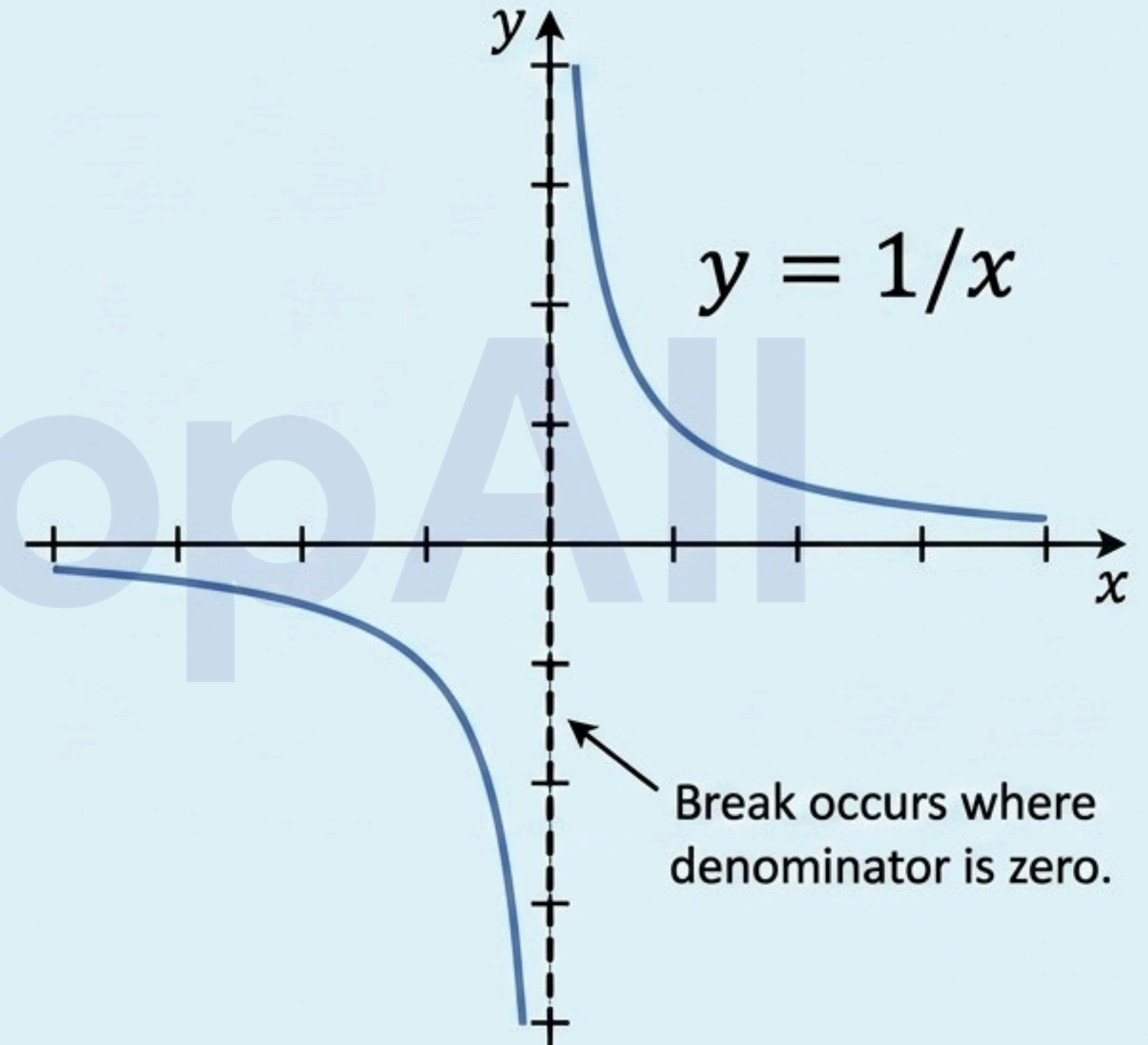
Polynomial p

✓ Continuous

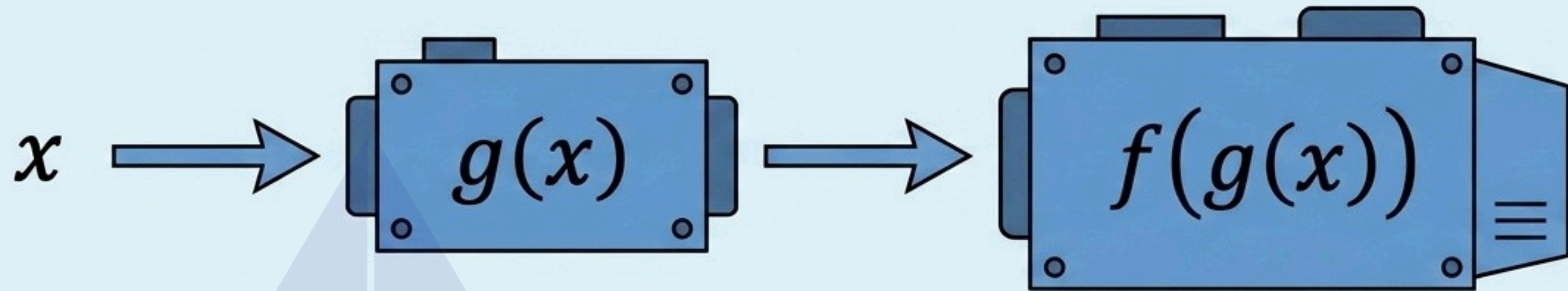
Polynomial q

✓ Continuous

p/q continuous
whenever $q(x) \neq 0$



Continuity Through Function Layers



$$(f \circ g)(x) = f(g(x))$$

g continuous at c

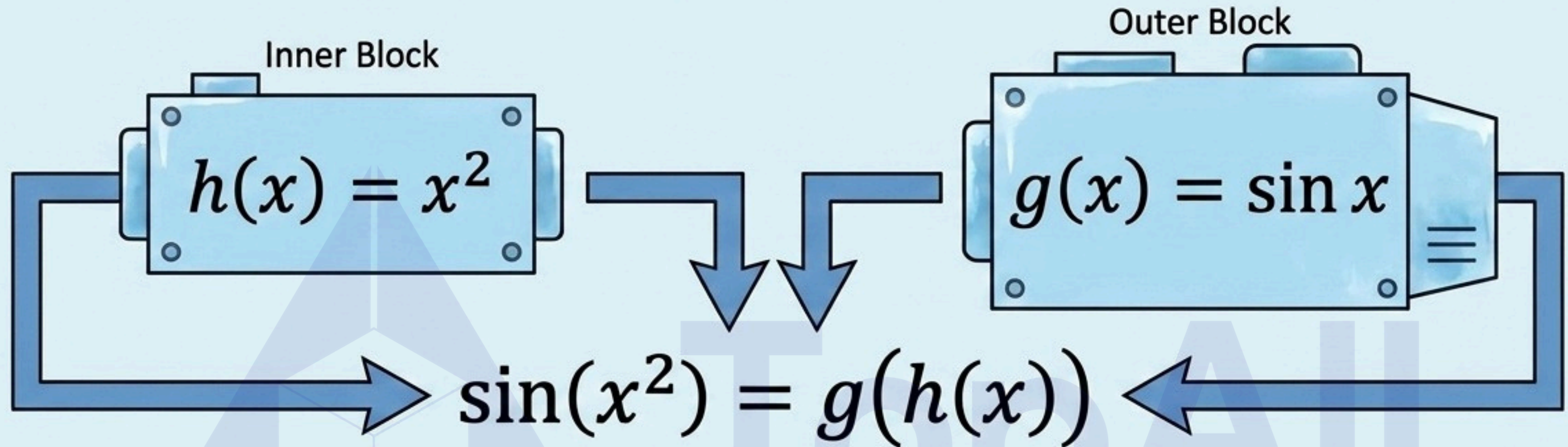
AND

f continuous at $g(c)$

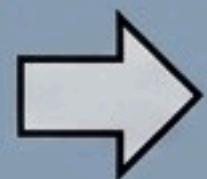


$f \circ g$ continuous at c

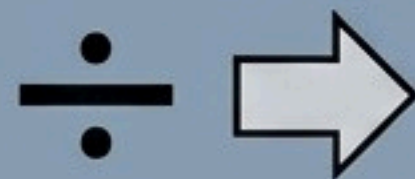
Example: $\sin(x^2)$



- ✓ Since both components are continuous everywhere, the composite $\sin(x^2)$ is continuous.



safe for
continuous
functions



$\div$ check
denominator



$\circ$ check inner
and outer
continuity



You've Learned the Theory.

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