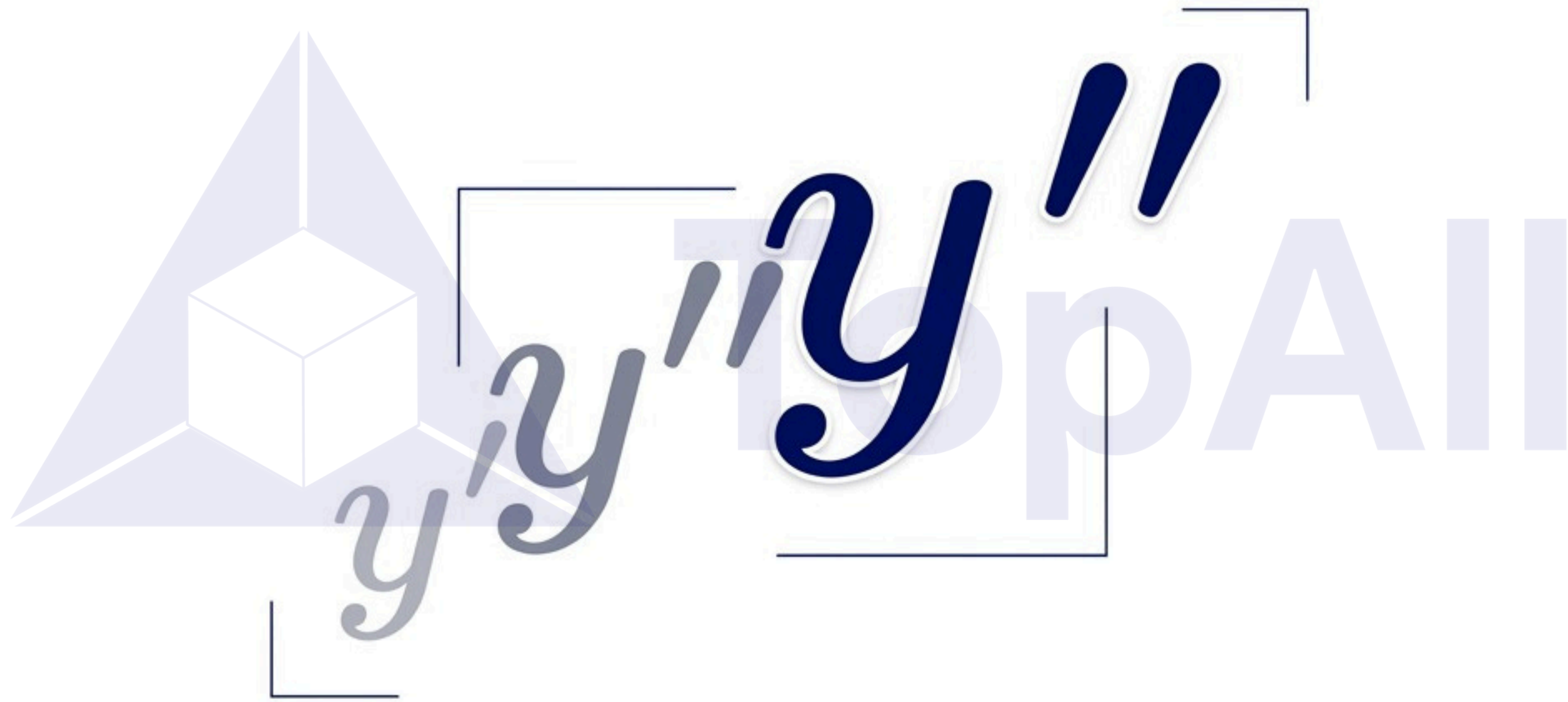


Order of a Differential Equation



The highest derivative decides everything



Which derivative is the highest?

What Is Order?

The order of a differential equation is the order of the highest-order derivative present in it.



All derivatives

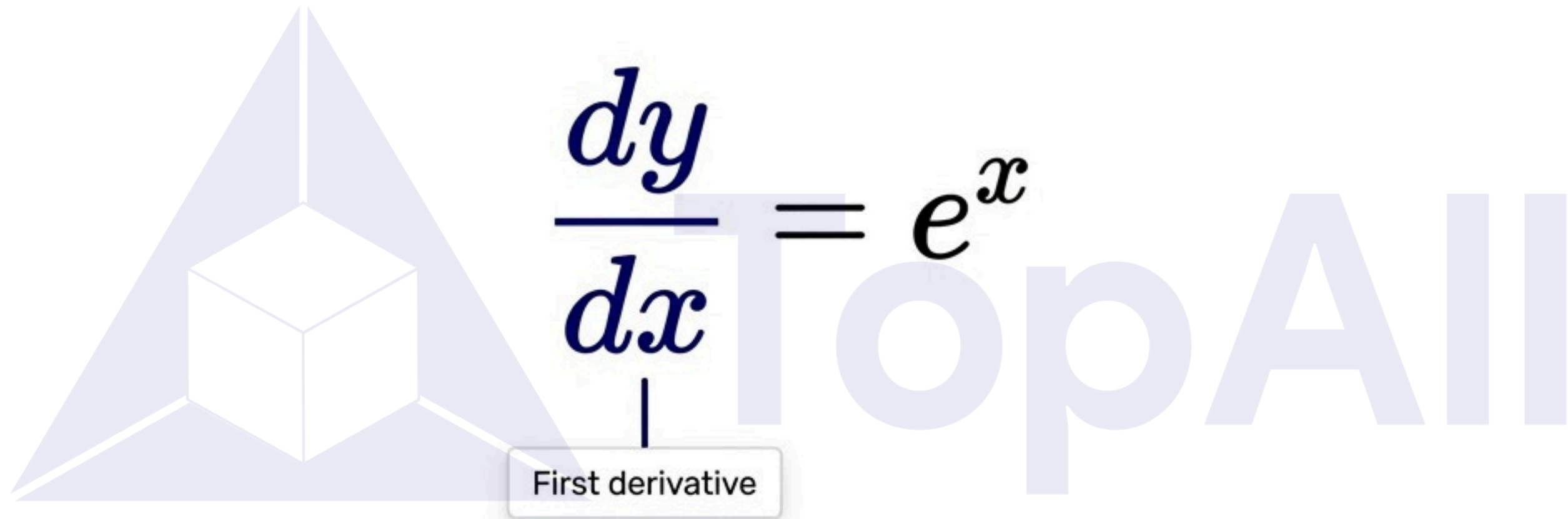
✓ locate

Highest derivative

✓ equals

ORDER

Example: First Order


$$\frac{dy}{dx} = e^x$$

First derivative

ORDER = 1



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$$E=mc^2$$



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Example: Second Order

$$d^2y/dx^2 + y = 0$$

Second derivative

ORDER = 2

Ignore the Lower Derivatives

$$2y''' + (y'')^3 + (y')^4 + y^5 = 0$$

Highest derivative = third

ORDER = 3

Caution: Do not use powers of x , y , or lower derivatives to determine order.

Order in 3 Steps

- 1** Locate all derivatives
- 2** Find the highest-order derivative
- 3** Read its order

Highest derivative wins.

Do NOT confuse:
order of derivative
with
power of derivative.



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