# The Taylor Series Expansion

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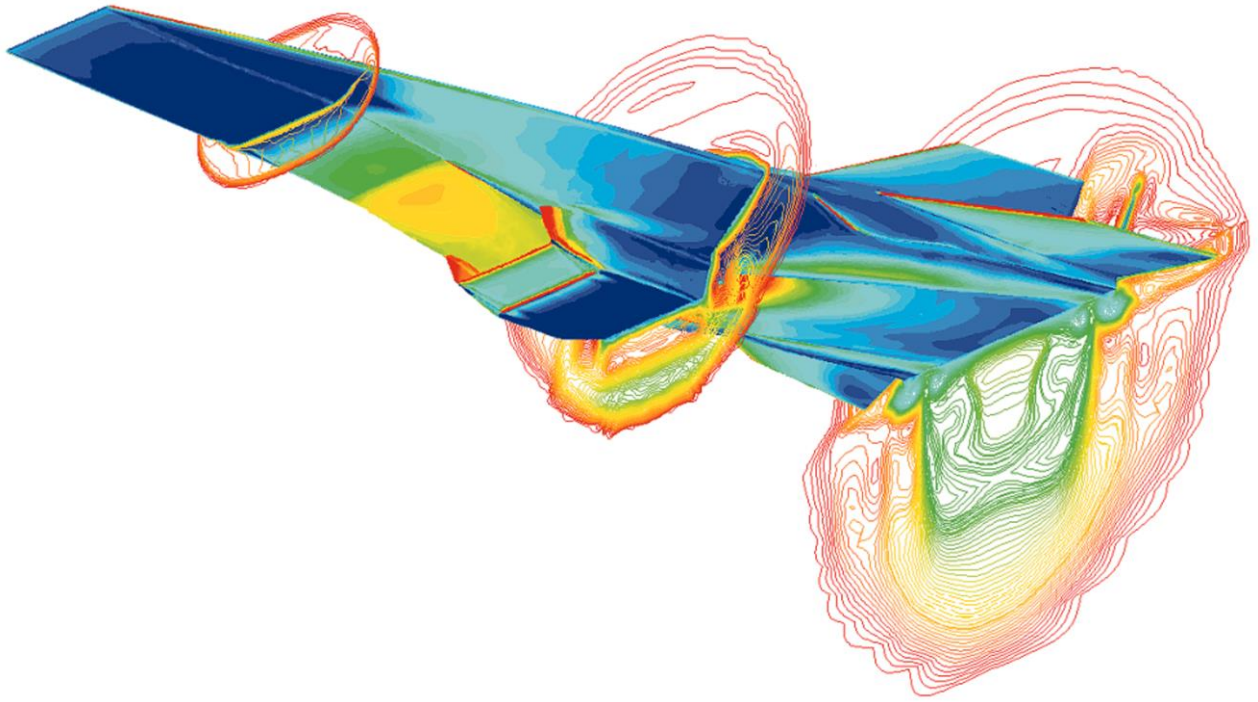

# Example of a Taylor Series Approximation

$$f(x) = \underset{1}{f(a)} + \underset{2}{(x-a)f'(a)} + \underset{3}{\frac{(x-a)^2}{2!}f''(a)} + \underset{4}{\frac{(x-a)^3}{3!}f'''(a)} + \cdots$$

Let $f(x) = \sin(x); a = 0$

The numbering convention used in the Taylor series is shown in red above (even potentially zero-value terms are numbered)

**Error in Lecture (at 13:14 mark):** these numbers in the legend were incorrectly listed as 3,5,7,9. (Hat tip to Matt Williams for identifying the error)