# MENGAPA BILANGAN EULER $e = 2,718281\ldots$ ?

$$\left.\begin{aligned}
f(x) &= e^x \rightarrow f(0) = e^0 = 1 \\
f'(x) &= e^x \rightarrow f'(0) = e^0 = 1 \\
f''(x) &= e^x \rightarrow f''(0) = e^0 = 1 \\
f'''(x) &= e^x \rightarrow f'''(0) = e^0 = 1 \\
f^{(4)}(x) &= e^x \rightarrow f^{(4)}(0) = e^0 = 1 \\
f^{(5)}(x) &= e^x \rightarrow f^{(5)}(0) = e^0 = 1
\end{aligned}\right\} \quad f^{(n)}(x) = e^x \rightarrow f^{(n)}(0) = e^0 = 1$$

## DERET MAC LAURIN

$$f(x) = f(0) + \frac{f'(0)}{1!}x + \frac{f''(0)}{2!}x^2 + \frac{f'''(0)}{3!}x^3 + \frac{f^{(4)}(0)}{4!}x^4 + \frac{f^{(5)}(0)}{5!}x^5 + \frac{f^{(6)}(0)}{6!}x^6 + \frac{f^{(7)}(0)}{7!}x^7 + \frac{f^{(8)}(0)}{8!}x^8 + \frac{f^{(9)}(0)}{9!}x^9 + \ldots$$

$$e^x = 1 + \frac{1}{1!}x + \frac{1}{2!}x^2 + \frac{1}{3!}x^3 + \frac{1}{4!}x^4 + \frac{1}{5!}x^5 + \frac{1}{6!}x^6 + \frac{1}{7!}x^7 + \frac{1}{8!}x^8 + \frac{1}{9!}x^9 + \ldots$$

$$e^x = 1 + \frac{x}{1!} + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \frac{x^5}{5!} + \frac{x^6}{6!} + \frac{x^7}{7!} + \frac{x^8}{8!} + \frac{x^9}{9!} + \ldots$$

UNTUK $\boxed{x = 1}$

$$\rightarrow e = 1 + 1 + \frac{1^2}{2.1} + \frac{1^3}{3.2.1} + \frac{1^4}{4.3.2.1} + \frac{1^5}{5.4.3.2.1} + \frac{1^6}{6.5.3.2.1} + \frac{1^7}{7.6.5.4.3.2.1} + \frac{1^8}{8.7.6.5.4.3.2.1} + \frac{1^9}{9.8.7.6.5.4.3.2.1} + \ldots$$

$$e = \underbrace{1 + 1} + \frac{1}{2} + \frac{1}{6} + \frac{1}{24} + \frac{1}{120} + \frac{1}{720} + \frac{1}{5040} + \frac{1}{40320} + \frac{1}{362880} + \ldots$$

$$e = 2 + 0.5 + 0.166666667 + 0.041666667 + 0.008333333 + 0.001388889 + 0.000198413 + 2.48016\text{ E-05} + 2.75573\text{ E-06} + \ldots$$

$$e = 2.718281526\ldots$$

$$\boxed{e = 2.718281\ldots}$$