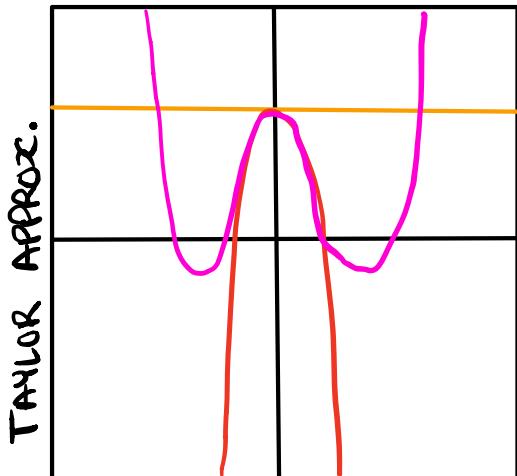


## PROBLEM #1.

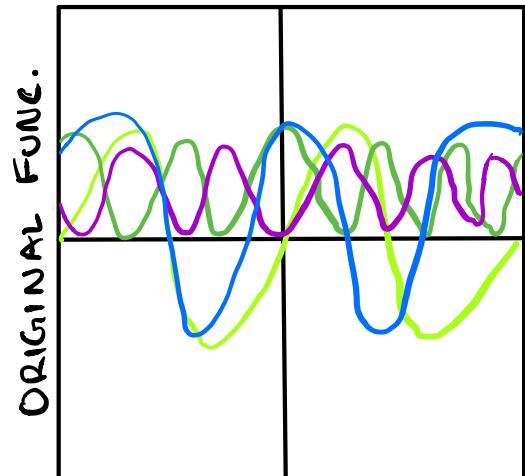
Given these functions - approximations formed with the Taylor Series select the plot best represented by these approximations.



$$f_0(x) = 1$$

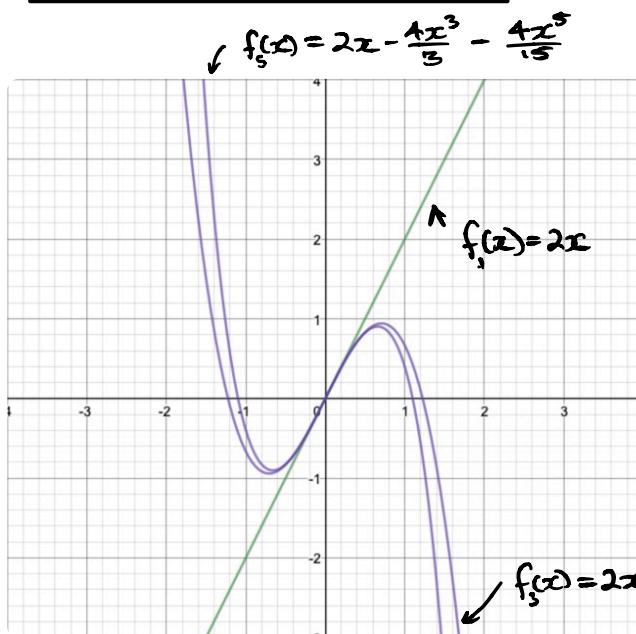
$$f_1(x) = 1 - \frac{x^2}{2} + \frac{x^4}{24}$$

$$f_2(x) = 1 - \frac{x^2}{2}$$

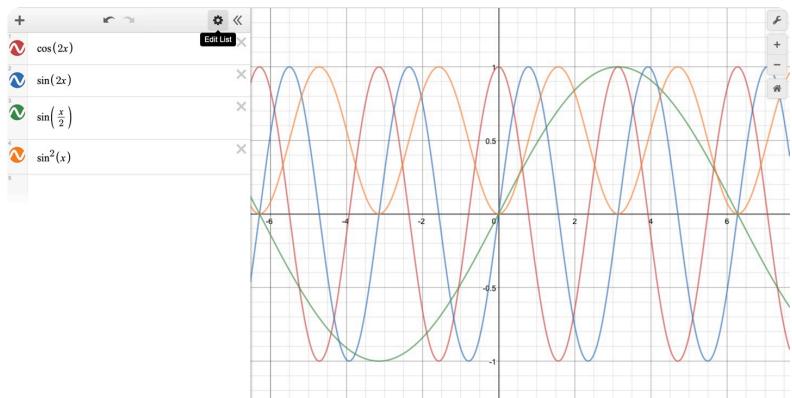


- $f(x) = \sin(x)$
- $f(x) = \cos^2(x)$
- $f(x) = \sin^2(x)$
- $f(x) = \cos(x)$

## PROBLEM #2.



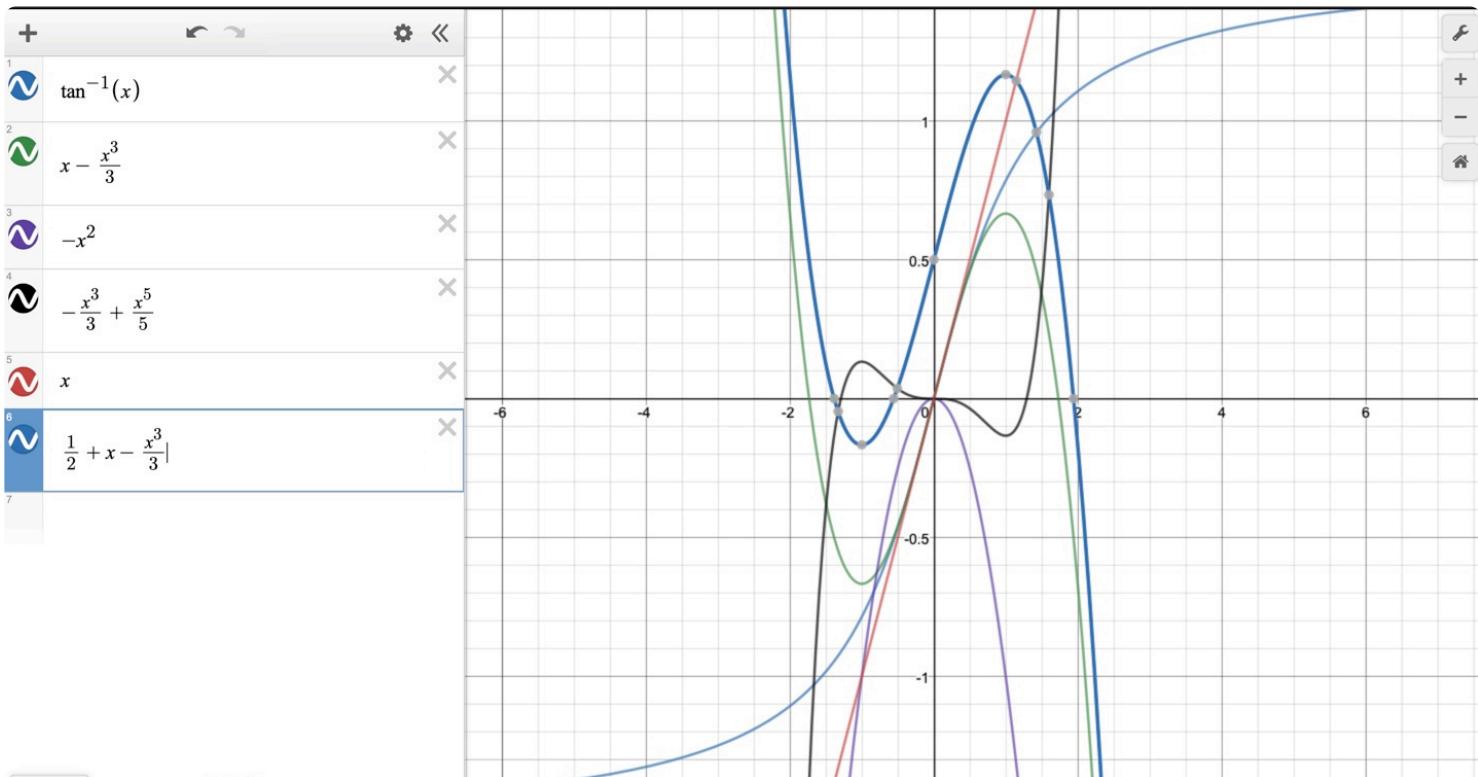
Taylor Series Approx.



Original Functions

- $\cos(2x)$
- $\sin(2x)$
- $\sin(x/2)$
- $\sin^2(x)$

### PROBLEM #3.



Which of these functions can be used to approximate

$f(x) = \tan^{-1}(x)$

$f_3(x) = -\frac{x^3}{3} + x$

$f_2(x) = -x^2$

$f_5(x) = \frac{x^5}{5} - \frac{x^3}{3}$

$f_1(x) = x$

$f_6(x) = -\frac{x^3}{3} + x + \frac{1}{2}$

### PROBLEM #4.

If the function to model is  $f(x) = \sin x$ , and the Taylor Series approximation is  $f(x) = x - \frac{x^3}{6}$ , which order is the model

zeroeth order

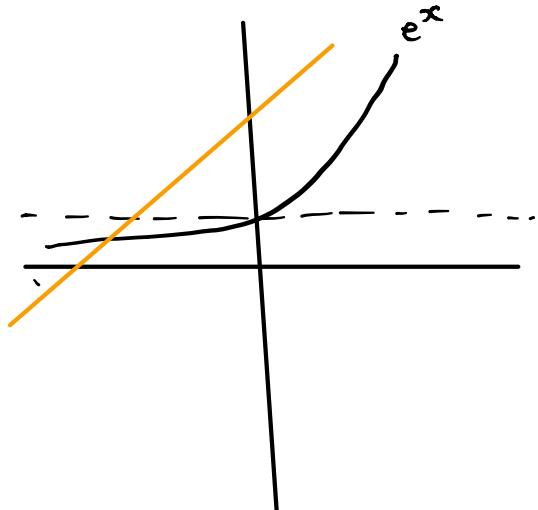
first order

third order

fifth order

none of the above

PROBLEM # 5.



Is the line an approximation  
of the euler exponential?

If it is what is it's approximation  
order?

- first       third
- second       not a correct approx.