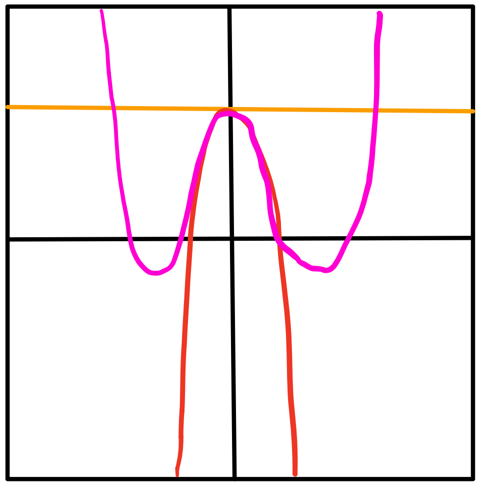
PROBLEM #1.

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

TAYLOR APPROX.

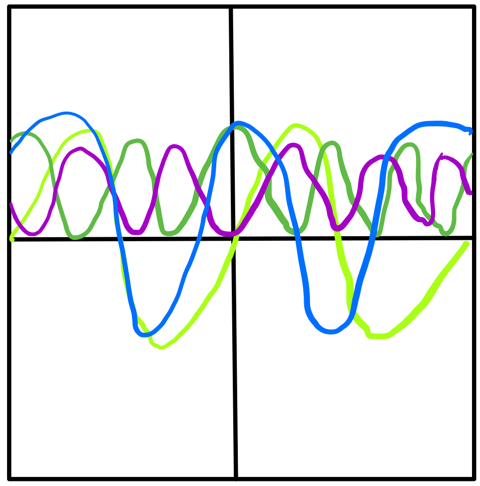


$f_0(x) = 1$

$f_4(x) = 1 - \frac{x^2}{2} + \frac{x^4}{24}$

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

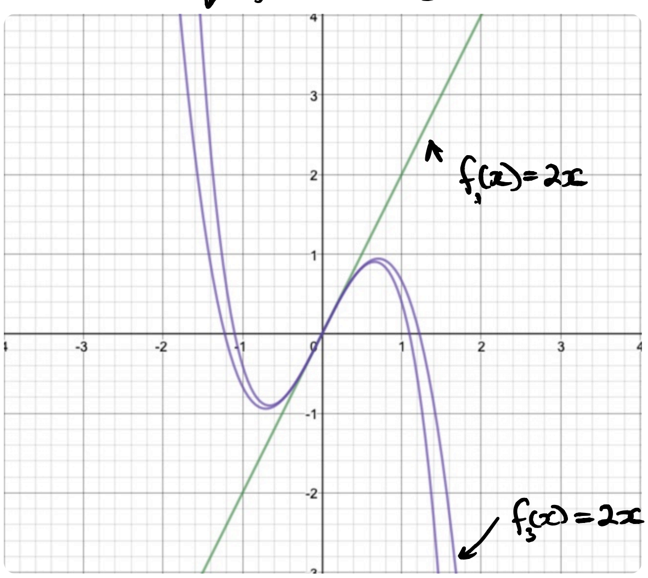
ORIGINAL FUNC.



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

PROBLEM #2.

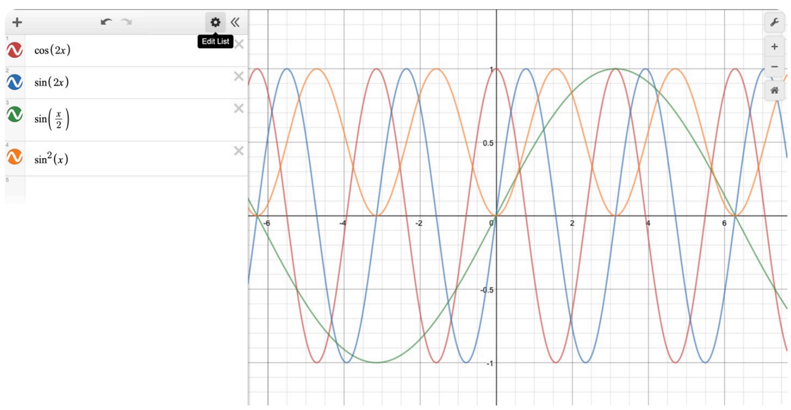
$f_5(x) = 2x - \frac{4x^3}{3} - \frac{4x^5}{15}$



$f_1(x) = 2x$

$f_3(x) = 2x - \frac{4x^3}{3}$

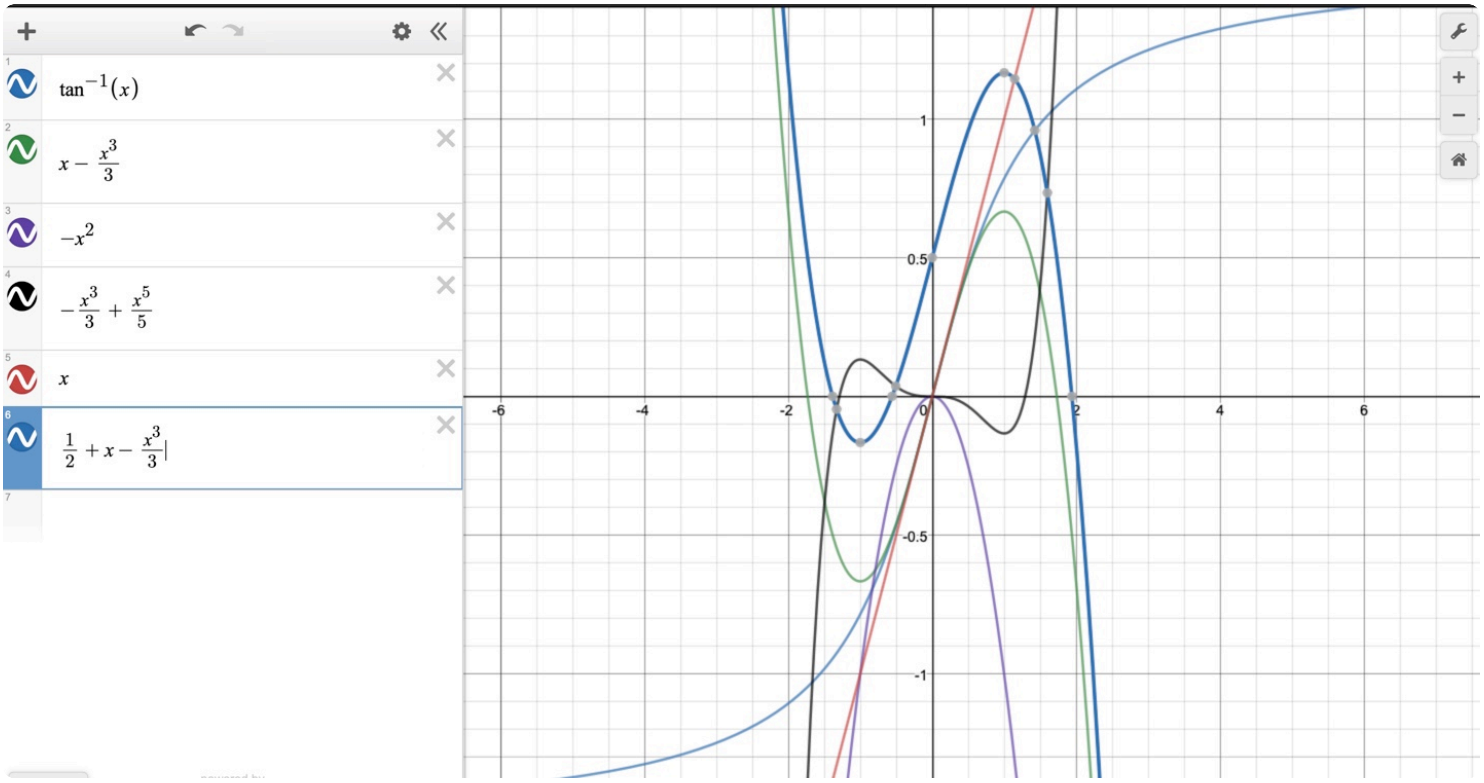
Taylor Series Approx.



Original Functions

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

PROBLEM #3.



Which of these functions can be used to approximate

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

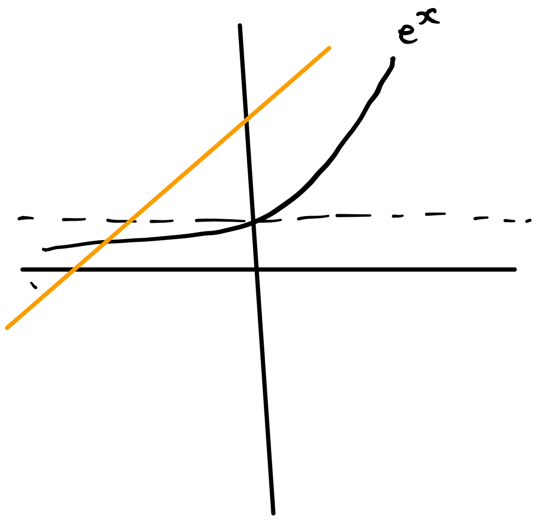
- [x] $f_3(x) = \frac{-x^3}{3} + x$
- [ ] $f_2(x) = -x^2$
- [ ] $f_5(x) = \frac{x^5}{5} - \frac{x^3}{3}$
- [x] $f_1(x) = x$
- [ ] $f_3(x) = -\frac{x^3}{3} + x + \frac{1}{2}$

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
- [x] 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.