

3. [10 points] For each of the following questions circle the correct answer.

a. [2 points] What is the value of the series $\sum_{n=0}^{\infty} \frac{(-1)^n 2^{2n}}{n!}$?

$\cos(2)$

e^{-2}

$\cos(4)$

e^{-4}

b. [2 points] What is the value of the series $\sum_{n=1}^{\infty} \frac{2^{2n} (-1)^n}{(2n+1)!}$?

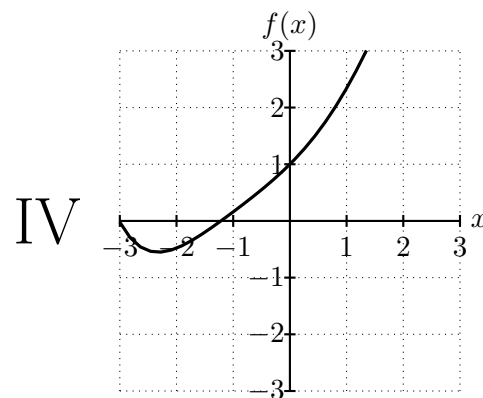
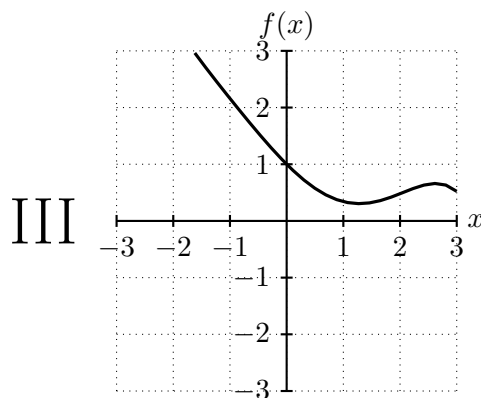
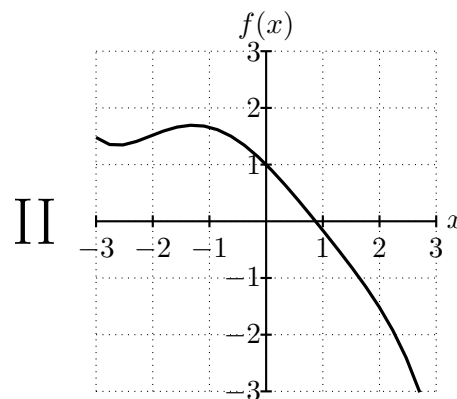
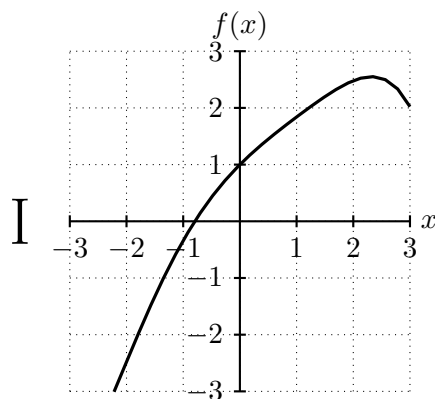
$\frac{1}{2} \sin(2)$

$\sin(2) - 2$

$\sin(2)$

$\frac{1}{2}(\sin(2) - 2)$

c. [2 points] Suppose that $1 + x - \frac{1}{4}x^2 + \frac{1}{10}x^3$ is the 3rd degree Taylor polynomial for a function $f(x)$. Which of the following pictures could be a graph of $f(x)$?



d. [2 points] What is the Taylor series of $2xe^{x^2}$ centered at $x = 0$?

$$\sum_{n=0}^{\infty} \frac{2x^{2n+1}}{n!}$$

$$\sum_{n=1}^{\infty} \frac{2x^{2n-1}}{n!}$$

$$\sum_{n=1}^{\infty} \frac{2x^{2n+1}}{(n-1)!}$$

$$\sum_{n=0}^{\infty} \frac{2x^{2n-1}}{n!}$$

e. [2 points] The radius of convergence of the Taylor series $\sum_{n=1}^{\infty} \frac{(x+5)^n 5^{-n}}{n+5}$ is $R = 5$. What is the interval of convergence of the series?

$[-10, 0)$

$(-10, 0)$

$(0, 10]$

$[-10, 0]$

$[0, 10]$