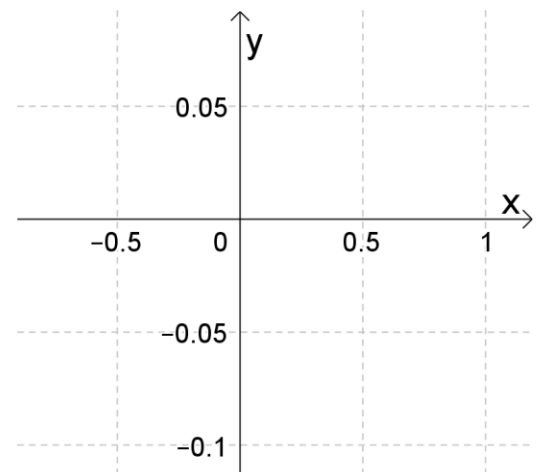


Due date: \_\_\_\_\_

Name: \_\_\_\_\_

1. Let  $f(x) = 4x^3 - 9x^4$ .

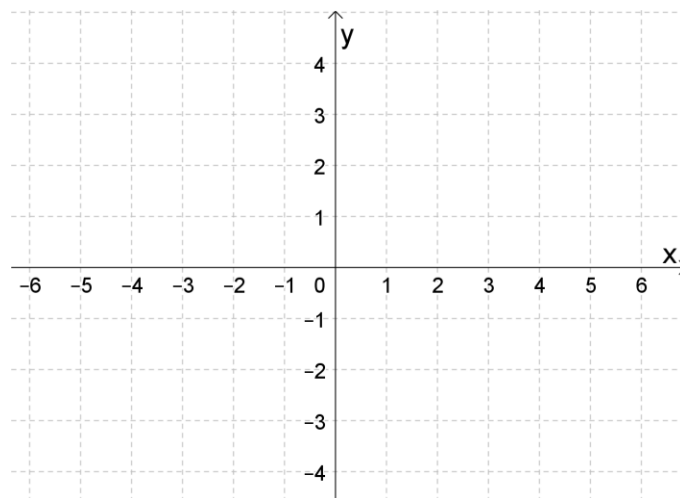
a) Find the domain of  $f$ .b) Find the  $x$ -intercept(s) and  $y$ -intercept of  $f$  (if none, write “none”).c) Find  $f'$  and  $f''$ , and determine where each are 0 and/or do not exist (DNE).d) Do a sign analysis on  $f'$  and  $f''$ .e) Find all local maxima, local minima, and inflection points of  $f$  (if any).f) Sketch the graph of  $f$ .

2. Let  $f(x) = \frac{x^2}{x^2-4}$ .

- a) Find the domain of  $f$ .
- b) Find the  $x$ -intercept(s) and  $y$ -intercept of  $f$  (if none, write "none").
- c) Find all vertical and horizontal asymptotes of  $f$ .
- d) Find  $f'$  and  $f''$ , and determine where each are 0 and/or do not exist (DNE).

- e) Do a sign analysis on  $f'$  and  $f''$ .

- f) Find all local maxima, local minima, and inflection points of  $f$  (if any).



- g) Sketch the graph of  $f$ .

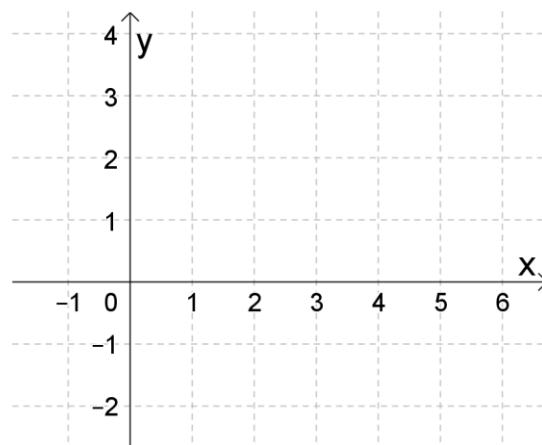
3. Let  $f(x) = x^2 e^{-x}$ .

- a) Find the domain of  $f$ .
- b) Find the  $x$ -intercept(s) and  $y$ -intercept of  $f$  (if none, write "none").
- c) Find all vertical and horizontal asymptotes of  $f$ .
- d) Find  $f'$  and  $f''$ , and determine where each are 0 and/or do not exist (DNE).

e) Do a sign analysis on  $f'$  and  $f''$ .

f) Find all local maxima, local minima, and inflection points of  $f$  (if any).

g) Sketch the graph of  $f$ .



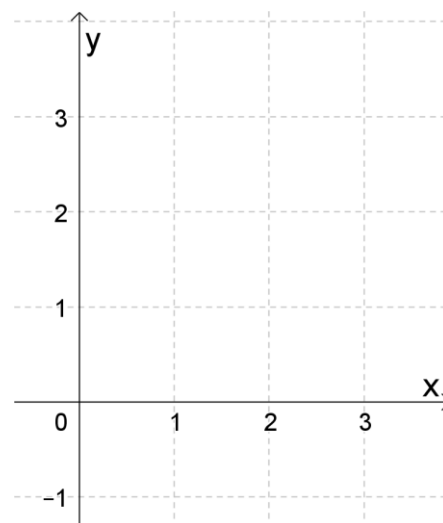
4. Let  $f(x) = x^2 \ln x$ .

- a) Find the domain of  $f$ .
- b) Find the  $x$ -intercept(s) and  $y$ -intercept of  $f$  (if none, write "none").
- c) Find all vertical and horizontal asymptotes of  $f$ .
- d) Find  $f'$  and  $f''$ , and determine where each are 0 and/or do not exist (DNE).

e) Do a sign analysis on  $f'$  and  $f''$ .

f) Find all local maxima, local minima, and inflection points of  $f$  (if any).

g) Sketch the graph of  $f$ .



5. Let  $f(x) = \sqrt{4x^2 + 1}$ .

- Find the domain of  $f$ .
- Find the  $x$ -intercept(s) and  $y$ -intercept of  $f$  (if none, write "none").
- Find  $f'$  and  $f''$ , and determine where each are 0 and/or do not exist (DNE).

- Do a sign analysis on  $f'$  and  $f''$ .

- Find all local maxima, local minima, and inflection points of  $f$  (if any).

- Sketch the graph of  $f$ .

