Due date: _____ **Name:** _____

1. Let $f(x) = 4x^3 - 9x^4$.
   a) Find the domain of f.

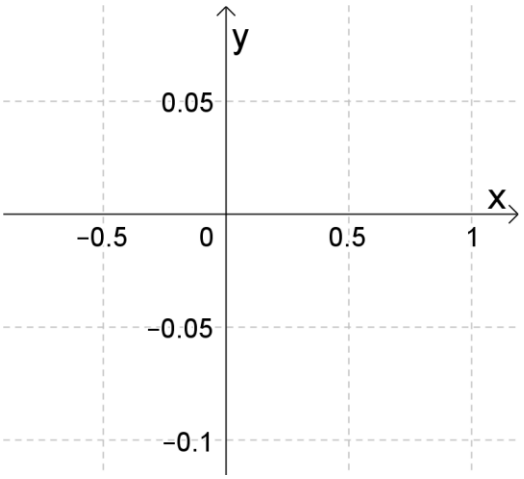
   b) Find the x-intercept(s) and y-intercept of f (if none, write "none").

   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").

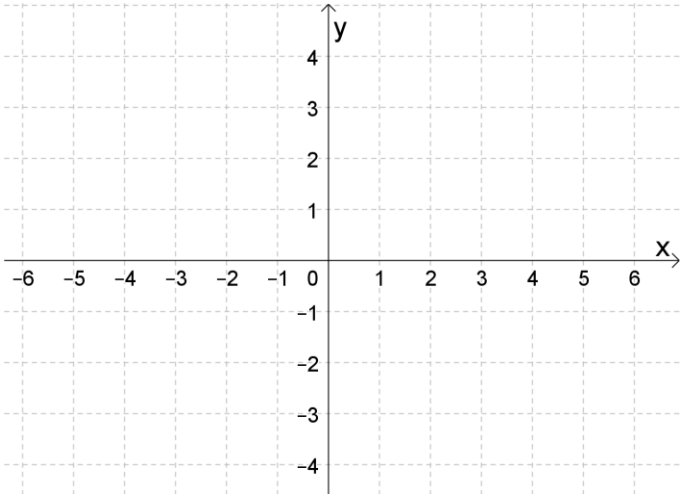
c) Find all vertical and horizontal asymptotes of f.

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. Find the intervals of concavity and inflection point(s) of $f(x) = x^2 e^{-x}$.

a) Find the domain of f.

b) Find the x-intercept(s) and y-intercept of f (if none, write "none").

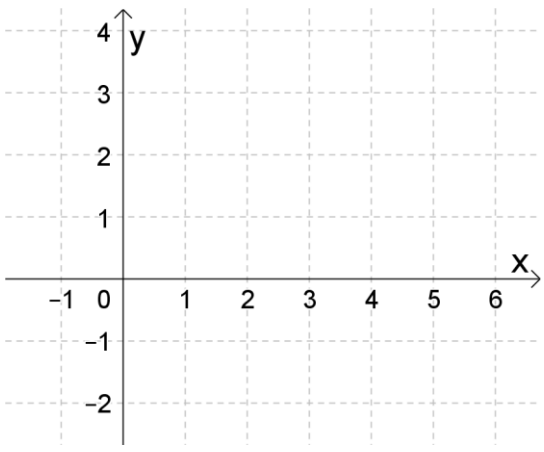
c) Find all vertical and horizontal asymptotes of f.

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. Find the intervals of concavity and inflection point(s) of $f(x) = x^2 \ln x$.
   a) Find the domain of f.

   b) Find the x-intercept(s) and y-intercept of f (if none, write "none").

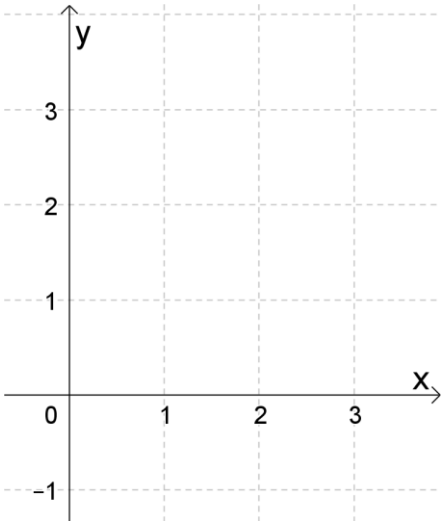
   c) Find all vertical and horizontal asymptotes of f.

   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. Find the intervals of concavity and inflection point(s) of $f(x) = \sqrt{4x^2 + 1}$.

a) Find the domain of f.

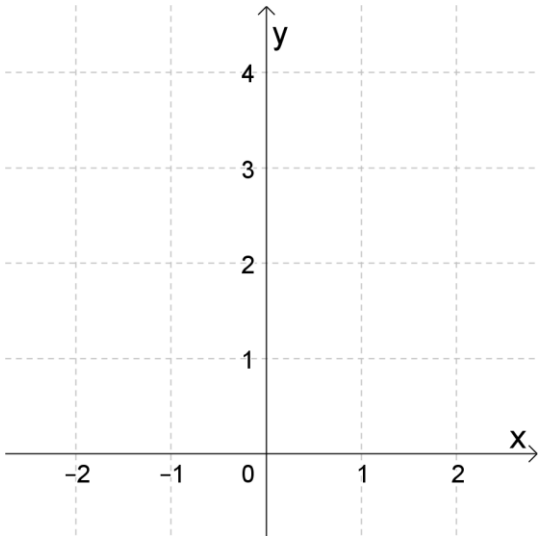
b) Find the x-intercept(s) and y-intercept of f (if none, write "none").

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.



6. Find the intervals of concavity and inflection point(s) of $f(x) = x^{5/3} - x^{2/3}$.

a) Find the domain of f.

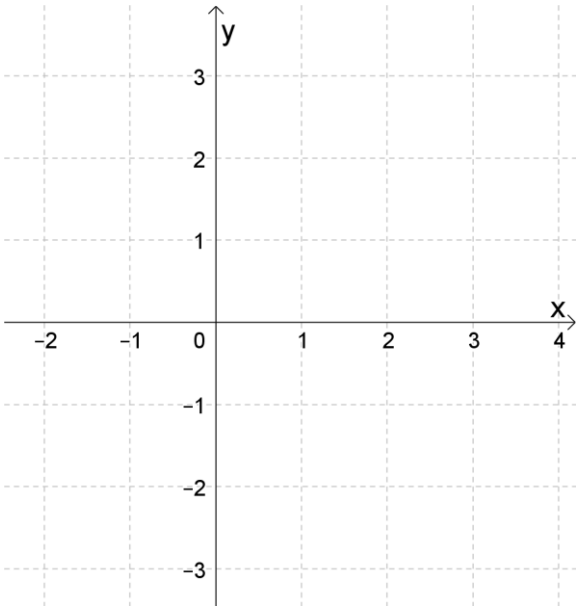
b) Find the x-intercept(s) and y-intercept of f (if none, write "none").

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.



Q: What's orange and sounds like a parrot?

Optional exercises from the Stewart textbook if you'd like more practice: 4.5 (p.321) #1-29 EOO, 37-45 EOO