Name: _____ Section: _____

Instructions: Show all your work. Make sure your work is legible, clear and dark enough to be seen. Your work must be written clearly using proper notation. Answers must be justified using techniques that have been taught in this course.

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1. a. **(9 pts)** Consider the function f and its derivatives below.

$$f(x) = \frac{2x^2 - 3x}{x - 2}, f'(x) = \frac{2(x-3)(x-1)}{(x-2)^2}, f''(x) = \frac{4}{(x-2)^3}$$

(Part a) Find the vertical and horizontal asymptotes of f. If needed, find the x-intercept, y-intercept.
(Part b) Find the first-order critical numbers, classify each as local minimum, maximum or neither. Find where f is decreasing and increasing. Remember to include the x-coordinates of the vertical asymptote on the sign chart.
(Part c) Find the second-order critical numbers, classify each as Point of Inflection or not. Find where f is concave down and concave up. Remember to include the x-coordinates of the vertical asymptote on the sign chart.
(Part d) Calculate the y-coordinates of all local minima, local maxima, and points of inflection. Write "NONE" for your answer if appropriate. Intervals should be given in a comma-separated list by using interval notation. Sketch the graph on the grid provided. Fill in the table below.

vertical asymptote(s):	
horizontal asymptote(s):	
where f is decreasing:	
where f is increasing:	
x-coordinate(s) of local minima:	
x-coordinate(s) of local maxima:	
where f is concave down:	
where f is concave up:	
x-coordinate(s) of inflection point(s):	

b. Sketch the graph of $f(x)$ on the provided grid below below. Make sure to label the scales on the axes! For each local extremum or inflection point, identify its coordinates and label the point "local min.", "local max", or "infl. pt." as appropriate.