

Books, notes (in any form), calculators, etc., are not allowed. You must *show all your work* for full credit. Good Luck!

1. (15 pts) Given the following function and its derivatives

$$f(x) = \frac{-3(x+1)}{x-3} = \frac{-3x-3}{x-3}$$

$$f'(x) = \frac{12}{(x-3)^2}$$

$$f''(x) = \frac{-24}{(x-3)^3}$$

(a). Fill in the following information about the function and its graph. Show all work and write “none”, if applicable.

domain: \_\_\_\_\_

x-intercept(s): \_\_\_\_\_

y-intercept: \_\_\_\_\_

vertical  
asymptote(s): \_\_\_\_\_

horizontal  
asymptote(s): \_\_\_\_\_

slant asymptote: \_\_\_\_\_

critical numbers: \_\_\_\_\_

intervals where  
increasing: \_\_\_\_\_

intervals where  
decreasing: \_\_\_\_\_

coordinates of  
local max(s): \_\_\_\_\_

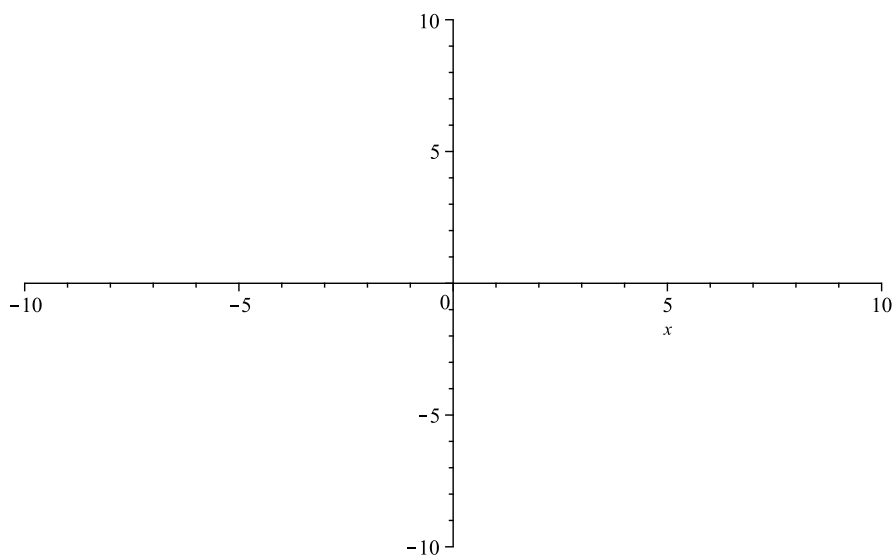
coordinates of  
local min(s): \_\_\_\_\_

intervals where  
concave up: \_\_\_\_\_

intervals where  
concave down: \_\_\_\_\_

Inflection Point(s): \_\_\_\_\_

(b). Sketch the graph of the function on the set of axes provided. Label any maximum and minimum values and inflection points.



Just an extra set of axes, in case you need it.

