

Remember to always show all supporting work.

1. (10 points) (See WeBWorK 4.4 #7) For this problem, refer to the function

$$f(x) = \frac{6 + 4x}{12 - 4x}.$$

- (a) (Review.) Determine the domain of $f(x)$. Show supporting work.
- (b) Determine all critical numbers of $f(x)$. (Remember to think about the domain.)
- (c) Determine intervals where $f(x)$ is increasing and decreasing.
- (d) Determine intervals where $f(x)$ is concave up and concave down. (Hint: For f'' , try something other than the quotient rule.)

(e) (Review) Find all horizontal asymptotes of $f(x)$. Use one or more limits to support your work. (If there are no horizontal asymptotes, write “none.”)

(f) (Review) Find all vertical asymptotes of $f(x)$. Use one or more limits, including justification, to support your work. (If there are no vertical asymptotes, write “none.”)

(g) Sketch a graph of $f(x)$ where you show the increasing/decreasing behavior, the concavity, and all asymptotes.

