

Give the details of each characteristic for the following functions in problems (1) – (3)

- | | |
|---|--|
| a. Domain of the function | f. Differentiability |
| b. x - and y -intercepts | g. Intervals of increase and decrease |
| c. Symmetry | h. Local maximums and local minimums |
| d. End behavior (limits at $\pm\infty$) including horizontal or slant asymptotes | i. Intervals of upward or downward concavity |
| e. Vertical Asymptotes | j. Inflection points |

$$(1) f(x) = \frac{2(x^2-9)}{x^2-4}$$

$$(2) f(x) = \frac{x}{\sqrt{x^2+2}}$$

(3) $f(x) = \frac{2x^3}{x^2+1}$

(4) Find two positive numbers such that the second is the reciprocal of the first and the sum is minimized.

(5) A box is to be made with a square base and no top. It must be made to hold 16 cubic inches of sand. Find the dimensions of the box of least surface area.