

The best way to review is to work these problems as if it were a test. Then you can check your answers. The relevant sections/examples to use for review will be posted along with the answers. Review and then use these to test yourself again!

## Self-Test A

- 1) Using algebra and calculus, find each of the following for the function  $f(x) = \frac{10}{x(x-3)^2}$
- The x- and y-intercepts
  - The vertical asymptotes
  - The horizontal asymptotes
  - The intervals of increase and decrease
  - The local maxima and minima
  - The intervals of concavity
  - The inflection points
  - Sketch the complete graph on graph paper.
- 2) The volume of a cube is increasing at a rate of  $5 \text{ cm}^3/\text{sec}$ . How fast is the surface area increasing when the length of an edge is  $10\text{cm}$ ?
- 3) We wish to build a fence which encloses a rectangular area. One side of the rectangle is along a river, so it does not need to have a fence on that side. We have only 500 feet of fencing to use. What dimensions of the rectangle will give the maximum area? What is the maximum area?

## Self-Test B

- 1) Using algebra and calculus, find each of the following for the function  $f(x) = \frac{2x^2}{x^2-4}$ 
  - a) The x- and y-intercepts
  - b) The vertical asymptotes
  - c) The horizontal asymptotes
  - d) The intervals of increase and decrease
  - e) The local maxima and minima
  - f) The intervals of concavity
  - g) The inflection points
  - h) Sketch the complete graph on graph paper.
- 2) A cylindrical tank with radius 5 feet is being filled with water at a rate of 2 cubic feet per hour. What is the rate of change of the height of the water in the tank?
- 3) A box with square base and open top must have a volume of 500 cubic inches. What are the dimensions of the box which minimize the surface area?