BC CALCULUS PRACTICE 5R **Name:** ___________________________ **Period** _______

Aisle _________

pg. 344 – 26b, 35, 43, 54d, 55cd, 57cd, 60, 71a, 72bc, 76

Show all work for full credit.

26b. Locate the critical points and identify which critical points correspond to stationary points. $f(x) = x^{4/3} - 6x^{1/3}$	35. Given a graph of f, and identify the limits as $x \to \pm\infty$, as well as locations of all relative extrema, inflection points, and asymptotes (as appropriate.) $f(x) = \begin{cases} \frac{1}{2}x^2, & x \le 0 \\ -x^2, & x > 0 \end{cases}$
43. Use any method to find the relative extrema of the function f. $f(x) = \ln(1 + x^2)$	54d. Find the absolute minimum m and the absolute maximum M of f on the given interval (if they exist), and state whre the absolute extrema occur. $f(x) = -\lvert x^2 - 2x\rvert;\ [1,3]$

55. Find the absolute minimum m and the absolute maximum M of f on the given interval (if they exist), and state whre the absolute extrema occur.

c. $f(x) = \frac{e^x}{x^2}; (0, \infty)$

d. $f(x) = x^x; (0, \infty)$

57. Use a graphing utility to estimate the absolute maximum and minimum values of f, if any, on the stated interval, and then use calculus methods to find the exact values.

c. $f(x) = 2\sec x - \tan x\,; \left[0, \frac{\pi}{4}\right]$

d. $f(x) =, \frac{x}{2} + \ln(x^2 + 1)\,; [-4,0]$

60.

A church window consists of a blue semicircular section surmounting a clear rectangular section as shown in the accompanying figure. The blue glass lets through half as much light per unit area as the clear glass. Find the radius r of the window that admits the most light if the perimeter of the entire window is to be P feet.

71a.

In each part, determine whether all of the hypotheses of Rolle's Theorem are satisfied on the stated interval. If not, state which hypotheses fail; if so, find all values of c guaranteed in the conclusion of the theorem.

(a) $f(x) = \sqrt{4 - x^2}$ on $[-2, 2]$

72.

In each part, determine whether all of the hypotheses of the Mean-Value Theorem are satisfied on the stated interval. If not, state which hypotheses fail; if so, find all values of c guaranteed in the conclusion of the theorem.

(b) $f(x) = \dfrac{x+1}{x-1}$ on $[2, 3]$

(c) $f(x) = \begin{cases} 3 - x^2 & \text{if } x \leq 1 \\ 2/x & \text{if } x > 1 \end{cases}$ on $[0, 2]$

76.

Suppose that the position function of a particle in rectilinear motion is given by the formula

$$s(t) = \frac{t}{2t^2 + 8}$$
$$t \geq 0$$

a. Use a graphing utility to generate the position, velocity, and acceleration verseus time curves.
b. Use the appropriate graph to make a rough estimate of the time when the particle reverses direction, and then find that time exactly.
c. Find the position, velocity, and acceleration at the instant when then particle reverses direction.
d. Use the appropriate graphs to make rough estimates of the time intervals on which the particle is speeding up and the time intervals on which it is slowing down, and then find those time intervals exactly.
e. When does the particle have its maximum and minimum velocities?