Name:

Note: Use of scrap paper and/or a basic calculator is permitted.

[4]   1. Find the absolute maximum and minimum of $f(x) = x + \dfrac{4}{x}$ on $[1, 4]$.

2. A 5 metre long ladder is leaning against a vertical wall. If the base of the ladder is being pulled away from the wall at a rate of $1/3$ m/s, how fast is the top of the ladder sliding

[4]   down the wall when it is 3 m from the ground?
Suggestion: On a set of coordinate axes, locate the base of the wall at $(0, 0)$, the top of the ladder at $(0, y)$, and the bottom of the ladder at $(x, 0)$.

[4]

3. Find the area of the largest rectangle that can be inscribed in a *semicircle* of radius R, if one side of the rectangle must lie along the diameter of the semicircle.

[4]   4. Use a linear approximation to estimate the value of $\sqrt{9.2}$.