Honors Brief Calculus **5.4/5.6 Group Work** Name_____
In Class Part

1. A builder wants to fence in 135,000 square meters of land in a rectangular shape. Because of security reasons, the fence in the front will cost $2 per meter, while the fence for the other three sides will cost $1 per meter. How much of each type of fence will be needed to minimize cost? What is the minimum cost?

2. A child throws a stone into a still millpond, causing a circular ripple to spread. If the radius of the circle increases at the constant rate of 0.6 ft per second, how fast is the area of the ripple increasing when the radius of the ripple is 25 feet?

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Take Home Part

3. A printer plans on having 60 square inches of printed matter per page and is required to allow for margins of 1 inch on all sides. What are the most economical dimensions for each page if the cost per page depends on the area of the page?

4. A company wants to manufacture cylindrical aluminum cans with a volume of 1000 cubic centimeters (one liter). What should the radius and height of the can be to minimize the amount of aluminum used?
   $V = \pi r^2 h$ $S = 2\pi rh + 2\pi r^2$

5. A 50-foot ladder is placed against a large building. The base of the ladder is resting on an oil spill, and it slips (away from the bottom of the building) at the rate of 3 feet per minute. Find the rate of change of the height of the top of the ladder above the ground at the instant when the base of the ladder is 30 feet from the base of the building.