Two light sources of identical strength are placed 10 meters apart. A wall 10 meters long parallel to the two lights is a distance \( d \) meters away. The intensity of the light from each bulb at a point is inversely proportional to the distance from the bulb to the point.

Wall

![Diagram of light sources and wall](image_url)

a) Find an expression for the intensity of the light at points on the wall.

b) If \( d = 5 \), show that the minimum intensity of the light occurs at the point on the wall midway between the two lights.

c) If \( d = 10 \), show that the intensity of the light is not minimized at the point on the wall midway between the two lights.

d) Show that somewhere between \( d = 5 \) and \( d = 10 \), there is a transitional value of \( d \) at which the point of minimum illumination abruptly changes. Find the (exact!) value of \( d \) at which this occurs.

e) Find the point at which the intensity of the light is at a minimum, for all values of \( d \). Discuss your results.

Rules:

1. The assignment is due at the beginning of class on Friday, December 10, 1999.
2. This project is to be completed by teams of 2 or 3 students. You may not discuss this project with other members of class, or with anyone outside of class. You may (only) discuss the project with the instructor.
3. Aside from the restrictions in (2) above, the use of outside references is acceptable, and indeed encouraged. However, all outside references need to be properly acknowledged.
4. Answers should be a well-written paper that describes the problem and the solution. All of the usual rules of English grammar and composition apply.
5. Papers need to be neat, clean, and paper-clipped or stapled. They do not need to be typed or written in ink, but they must be legible and easily readable.
6. Copying the work of another student or portions of a published work constitutes plagiarism. Plagiarism or any other form of academic dishonesty may be reported to the Dean for action.