1. Let \( \mathbf{u} = (1, 2, 3) \) and \( \mathbf{v} = (5, 2, 9) \).

(a) What is \( \text{Lerp}(\mathbf{u}, \mathbf{v}, \frac{1}{3}) \)?

(b) What is \( \text{Lerp}(\mathbf{v}, \mathbf{u}, \frac{2}{3}) \)?

(c) What is \( \text{Lerp}(\mathbf{u}, \mathbf{v}, 1) \)?

(d) What is \( \text{Lerp}(\mathbf{u}, \mathbf{v}, -1) \)?

(e) What value of \( \alpha \) makes \( \text{Lerp}(\mathbf{u}, \mathbf{v}, \alpha) \) equal to \( (2, 2, \frac{9}{2}) \)?

(f) Let \( L \) be the line containing \( \mathbf{u} \) and \( \mathbf{v} \). Let \( \mathbf{z} = (1, 2, 9) \). Find the value \( \beta \) such that \( \text{Lerp}(\mathbf{u}, \mathbf{v}, \beta) \) is the point on the line \( L \) that is closest to \( \mathbf{z} \).