Problem statement a) Suppose that $\mathbf{a}$ and $\mathbf{b}$ are three-dimensional vectors and that $\|\mathbf{a}\| = 10$ and $\|\mathbf{b}\| = 8$. How big could $\|\mathbf{a} + \mathbf{b}\|$ be? How small? Give a geometric argument as to why your answer is correct.

b) Suppose that in a) we know only that $8 \leq \|\mathbf{a}\| \leq 12$ and $7 \leq \|\mathbf{b}\| \leq 9$. Answer the same questions.

c) Suppose we know that $\|\mathbf{a}\| = \mathbf{10}$, $\|\mathbf{b}\| = \mathbf{6}$, and $9 < \|\mathbf{a} + \mathbf{b}\| < 11$. What information is there about the angle between $\mathbf{a}$ and $\mathbf{b}$?