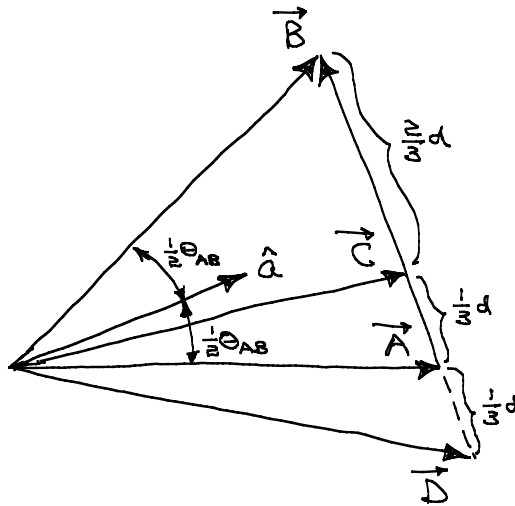


Homework Assignment #2
(60 points)

Due Tuesday, September 6
(at lecture)

2.6 (10 points) Challenge problem. Let \mathbf{A} and \mathbf{B} be the two vectors shown in the drawing. The magnitude of \mathbf{A} is A , the magnitude of \mathbf{B} is B , and the angle between \mathbf{A} and \mathbf{B} is θ_{AB} .



(a) Let d be the length of the line connecting the tips of \mathbf{A} and \mathbf{B} . Write an expression for d in terms of A , B , and θ_{AB} .

(b) Let \mathbf{C} and \mathbf{D} be the vectors shown in the drawing. Write expressions for \mathbf{C} and \mathbf{D} in terms of \mathbf{A} and \mathbf{B} . (Hint: If you find this hard, you're not doing it the right way.)

(c) Let $\hat{\mathbf{a}}$ be the *unit* vector shown in the drawing. The unit vector $\hat{\mathbf{a}}$ lies in the plane of \mathbf{A} and \mathbf{B} , and the angle between $\hat{\mathbf{a}}$ and \mathbf{A} is the same as the angle between $\hat{\mathbf{a}}$ and \mathbf{B} . Write an expression for $\hat{\mathbf{a}}$ in terms of \mathbf{A} , \mathbf{B} , A , B , and $\cos \theta_{AB}$.