

1. Solve a triangle with
 $a = 23, b = 18, m\angle B = 35^\circ$ (round angles and
side measures to the whole number)

2. Given x, y are angles in the first quadrant,
 $2\sec^2 x - 5\sec x + 2 = 0$ and $\tan^2 y = 1$. If
 $\vec{u} = \cos x \vec{i} + \cos 3x \vec{j}$ and $\vec{v} = \sin^2 y \vec{i} + \sin 2y \vec{j}$
Find $\|\vec{u} + \vec{v}\|$ (exact value)

3. If $\|\vec{w}\| = 8$ and the directional angle of the
vector \vec{w} is $\frac{\pi}{12}$. Write the component form of
vector \vec{w} (exact value.)

4. Consider \vec{u}_1 to be the image of transformation of vector \vec{u} after rotating about the origin clockwise 45° and \vec{v}_1 to be the image of transformation of vector \vec{v} after rotating about the origin clockwise 45° where \vec{u} and \vec{v} are from question 2. Find the component forms of \vec{u}_1 and \vec{v}_1 . (exact value)

5.
Consider $\vec{w} = \alpha\vec{u}_1 + \beta\vec{v}_1$, where vector \vec{u}_1 and \vec{v}_1 are from question 4 and vector \vec{w} is from question 3. Find (α, β) (exact value)

6. A tree is on a hillside with slope of certain degree when measured from the horizon. If the tree is 200 feet tall, and the angle of elevation at the top of the tree for an observer 80 feet downhill from where the tree is 70° , find the slope in terms of degree?(round to whole degree)