

3.3 – Vectors in the Plane
3.4 – Vectors and Dot Products

Overcome your resistance to drawing pictures.

1. (5 pts) Use vectors to find the interior angles of the triangle with the vertices $(-2, 3)$, $(4, 5)$, $(5, -6)$. Round final answers to 4 place
2. Let $\vec{u} = \langle 2, 8 \rangle$ and $\vec{v} = \langle 7, -1 \rangle$.
 - a. (5 pts) Find the projection of \vec{u} onto \vec{v} , which is to say, "Find $\text{proj}_{\vec{v}}\vec{u}$." Give exact answers. Simplify answers as much as possible, which means simplified radical form if radicals are involved.
 - b. (5 pts) Write \vec{u} as the sum of two orthogonal vectors \vec{w}_1 and \vec{w}_2 such that \vec{w}_1 is parallel to \vec{v} and \vec{w}_2 is orthogonal to \vec{w}_1 . Give exact answers. Simplify answers as much as possible, which means simplified radical form if radicals are involved. (Gram-Schmidt Orthogonalization)

3. (5 pts) A father is pulling his son in a wagon on the beach. If the angle the handle makes with the ground is 45° , and he's pulling with a force of 30 pounds, what is the work done if he pulls the wagon 100 yards? Give your answer in foot-pounds, rounded to the nearest whole number

