Quantifying Shear:
Angular Shear Strain & Shear Strain

When objects or particles within an object or fluid pass by each other, we say *shearing* has occured. Shearing creates changes in angles between lines within an object, so we can quantify shearing using what is called *angular shear strain*, which is a measure of changes in angles between lines within a distorted body. It is measured with respect to a line. In all the examples below, it is measured with respect to line A. In each example, the shear strain along line A is the change in the angle between line A and a line that was perpendicular to A before the strain occurred. In the examples, line B was perpendicular to line A before the strain event. Remember, the angle between A and B is what counts - any rotation of both A and B relative to some other frame of reference (e.g., north), is a rigid-body rotation, not shear strain. And don't forget that pure shear and simple shear cause shear strain to occur in rocks.

In the examples below, the undeformed arrangement of lines A and B is shown in the left column and the arrangement after deformation is shown on the right. The angular shear strain, ψ (psi), is noted for each example on the right side. *Shear strain* is the tangent to the angular shear strain and is usually called γ (gamma). Clockwise shear is called *dextral* and by convention is positive. Anti-clockwise is called *sinistral* and by convention is negative.