Problem 2.27 from "Advanced Stress and Applied Stress Analysis," Budynas, 2nd, McGraw-Hill


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>> [S]=[30, 20, -20; 20, 10, -10; -20, -10, 0]

S =   Stress tensor

    30    20   -20
    20    10   -10
   -20   -10     0

>> [VS, VD]=eig(S)

VS =  Eigen Vectors that give the directions of the Principal Stresses

    0.4472    0.4209    0.7892
   -0.0000   -0.8824    0.4706
    0.8944   -0.2105   -0.3946


VD =  Eigen values that are the Principal stresses for the given state of stress

  -10.0000         0         0
         0   -1.9258         0
         0         0   51.9258

>>
```

The maximum shear stress is 30.96MPa. This stress is in the xz plane with normal stresses in the x' and z' directions of 20.96MPa.