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def ISA(hinft):
    import math

    ft = 0.3048
    h = hinft*ft
    R = 287.0
    g0 = 9.80665

    if h>=-200:
        T0 = 288.15
        p0 = 101325.
        a = -0.0065
        h1 = min(h,11000.)
        T1 = T0 + a*h1
        p1 = p0*((T1/T0)**(-(g0/(a*R))))
        rho1 = p1/(R*T1)

    if h>11000.:
        h0 = h1
        h1=min(h,20000)
        T0 = T1
        p0 = p1
        T1 = T0
        p1 = p0*(math.exp(-(g0*(h-h0)/(R*T1))))
        rho1 = p1/(R*T1)

    if 20000.<h<=32000.:
        h0=20000.
        T0 = 216.65
        p0 = 5471.9351954
        a = 0.001
        h1 = min(h,32000.)
        T1 = T0 + a*(h1-h0)
        p1 = p0*((T1/T0)**(-(g0/(a*R))))
        rho1 = p1/(R*T1)

    if 32000.<h<=47000.:
        h0=32000.
        T0 = 228.65
        p0 = 867.255
        a = 0.0028
        h1 = min(h,47000.)
        T1 = T0 + a*(h1-h0)
        p1 = p0*((T1/T0)**(-(g0/(a*R))))
        rho1 = p1/(R*T1)

    if 47000.<h<=51000.:
        h0 = 47000.
        h1 = min(h,51000.)
        T1 = 270.65
        p1 = 110.766577
        T1 = T0
        p1 = p0*(math.exp(-(g0*(h-h0)/(R*T1))))
        rho1 = p1/(R*T1)

    if 51000.<h<=71000.:
        h0=51000.
        T0 = 270.65
        p0 = 66.8482964
        a = -0.0028
        h1 = min(h,71000.)
        T1 = T0 + a*(h1-h0)
        p1 = p0*((T1/T0)**(-(g0/(a*R))))
        rho1 = p1/(R*T1)

    if 71000.<h<=86000.:
        h0=71000.
        T0 = 214.64999999
        p0 = 3.949
        a = -0.0020
        h1 = min(h,86000.)
        T1 = T0 + a*(h1-h0)
        p1 = p0*((T1/T0)**(-(g0/(a*R))))
        rho1 = p1/(R*T1)

    return rho1

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