Quiz 2 Solutions

General equations for 1 and 2

$$\Delta Esys = E_i - E_o$$
$$\Delta U + \Delta KE + \Delta PE = Q_i$$
$$\Delta U = m(u_2 - u_1) = Q_i$$

Problem 3

$$\Delta E_{sys} = E_i - E_o$$

only electricity enters the room so the temperature goes up

$$c_p = \left(\frac{\delta h}{\delta dt}\right)$$

Steady Flow

$$\dot{m}h_i = \dot{m}h_g + Q_o$$

a steam turbine has a work out of 10mpa at 500c and a work out of 5MW

$$\dot{m}(h + \frac{v^2}{2} + g_z)_i = m(h + \frac{v^2}{2} + g_z)_o$$
$$\dot{m}h_i = \dot{m}h_o + \dot{W}_o$$
$$\dot{m}(h_i - ho) = \dot{W}_o$$
$$5x10^6 = \dot{m}(3375x10^3 - 2344x10^3)$$
$$\dot{m} = 4.85\frac{kg}{s}$$