Find c_{cal}

$q_{cal} = c_{cal}*\Delta T$, then $c_{cal} = \frac{q_{cal}}{\Delta T}$

$c_{cal} = \frac{80\ J}{(273.15+1.20)K} = 0.292\ \frac{J}{K}$

Heat absorbed by gasoline is:

$q_1 = nc_p\Delta T$

$n(C_8H_{18})$ = m/M = 8.50g/114g/mol = 0.0756 mol

T_{final} = 273.15 + 50 = 323.15 K

q_1 = 0.0756mol*39.36J/(mol·K)*(323.15-T_1)

Heat absorbed by calorimeter:

$q_2 = c_{cal}*\Delta T$

T_1 = 28 + 273.15 = 301.15 K

T_2 = 273.15 + 50 = 323.15 K

q_2 = 0.292J/K*(323.15-301.15)K = 6.424 J

q, supplied by electrical resistance heater, is 80.0 J

q, absorbed by gasoline and calorimeter is $q_1 + q_2$

0.0756mol*39.36J/(mol·K)*(323.15-T_1) + 6.424J = 80J

0.0756mol*39.36J/(mol·K)*(323.15-T_1) = 73.576J

323.15 - T_1 = 24.73

T_1 = 298.42

T (°C) = 298.42 – 273.15 = 25.72 °C

Answer: 25.72 °C