"Cowboy coffee" is a cup of coffee made by takings a "red-hot" branding iron (see picture to the right) and dunking it into a coffee pot (a pot of water containing coffee grounds). The temperature of the branding iron is significantly higher than the water, so the heat flows from the hot iron into the water.

1) If the temperature of the water/coffee (~2.0 L) increases from 20 °C to 80 °C, how much heat (q) was transferred into the water? [*assume the specific heat of the coffee is the same as water…4.184 J/(g°C)*]. **Show your work below.**

2) Using a highly accurate (*analytical*) means of adding heat to a similar pot of coffee, it was found that 1000.00 J of heat added to 100.00 g of brewed coffee resulted in a temperature increase of 2.456 °C. What is the true value of the specific heat for brewed coffee? [*include 4 significant figures in your answer*]. **Show your work below.**

3) Consider that the heat transferred into the water/coffee (answer to part 1) came from a hot branding iron that weighed ~1400 g. The heat capacity of iron is 0.45 J/(g°C), what was the temperature of the branding iron *at the time it was placed into* the water/coffee?
(Hint: - q_{Fe} = + q_{H_2O}) **Show your work below.**