Math-1003b Homework #6

Reading

- Section 8.5

Problems

The amount of heat energy (Q) needed to change the temperature of an object (without going through a phase change like melting or boiling) is jointly proportional to the mass of the object (m) and the *change* in temperature (ΔT).

1). Write an equation that models this physical phenomenon. Use c for the constant of proportionality.

2). The MKS unit for heat energy is the Joule (J). The constant of proportionality is specific to the substance being heated and is referred to as the *specific heat* of the substance. If Q is measured in Joules (J), m is measured in grams (g), and temperature is measured in Kelvin (K), what are the units of c?

3). In the lab, it is found that 41 790 J of heat energy raises the temperature of 1 L of water by 10 K. What is the specific heat of water? (1 L of water$=$ 1000 g)

4). How much energy (in Joules) is required to raise the temperature of 5 L of water by 5 K?