$$\ln \frac{800}{600} = 10k \ln e = 10k$$

$$k = \frac{\ln\left(\frac{800}{600}\right)}{10} = 0.03$$

differential equation: $\frac{dB}{dt} = (0.03)B$

(#10) a) $\frac{dD}{dt} = kD$

$$D(t) = Ce^{kt}$$

b) cooling rate proportional to temperature difference

cooling rate is rate of change of temp.

$$\frac{dT}{dt} = k\underbrace{(T-R)}_{\text{temp difference}}$$

c) $k < 0$ because the temperature T of the hot object is decreasing (cooling)

thus, $\frac{dT}{dt} < 0$.

d) i)