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$$1. \frac{dT}{dt} = k(T-25)$$

$$\frac{dT}{(T-25)} = k dt$$

$$\ln(T-25) = kt + C$$

$$T-25 = e^{kt+C}$$

$$T = T_0 e^{kt}$$

$$T = T_0 e^{kt} + 25$$

$$\text{At } t = 0$$

$$10 = T_0 + 25$$

$$T_0 = -15$$

$$T_0 = -15e^{kt} + 25$$

$$20 = -15e^{kt} + 25$$

$$\frac{-5}{-15} = \frac{-15e^{kt}}{-15}$$

$$0.33 = e^{kt}$$

$$-1.09 = kt$$

$$k = -0.219$$

$$T = -15e^{-0.219t} + 25$$

