

Name (printed): _____

Name (signature): _____

Numbers and formulas that may be useful.

$$g = 9.8 \text{ m s}^{-2}$$

$$G = 6.67 \times 10^{-11} \text{ m}^3 \text{ kg}^{-1} \text{ s}^{-2}$$

$$h = 6.63 \times 10^{-34} \text{ J s}$$

$$\sigma = 5.67 \times 10^{-8} \text{ W m}^{-2} \text{ K}^4$$

$$k_B = 1.38 \times 10^{-23} \text{ J K}^{-1}$$

$$M_{\text{Sun}} = 2 \times 10^{30} \text{ kg}$$

$$R_{\text{Sun}} = 6.96 \times 10^5 \text{ km}$$

$$L_{\text{Sun}} = 3.8 \times 10^{26} \text{ W}$$

$$M_{\text{Earth}} = 5.97 \times 10^{24} \text{ kg}$$

$$p^2 = 4 \pi^2 a^3 / [G (M_1 + M_2)]$$

$$v = c / \lambda$$

$$E \leq -(3/5) G M^2 / R$$

$$\text{Flux (emitted power per square meter)} = \sigma T^4$$

$$P = n k_B T$$

$$P V = N k_B T$$

$$\lambda_{\text{max}} = 2,900,000 \text{ nm} / T \text{ (Kelvin)}$$