Chapter 1

Problem 1.3

   (a) $A = \sqrt{\frac{\lambda}{\pi}}$.

   (b) $\langle x \rangle = a$, $\langle x^2 \rangle = a^2 + \frac{1}{2\lambda}$, $\sigma = \sqrt{\frac{1}{2\lambda}}$

Problem 1.5

   (a) $A = e^{i\alpha} \sqrt{\lambda}$.

   (b) $\langle x \rangle = 0$, $\langle x^2 \rangle = \frac{1}{2\lambda^2}$.

   (c) $\sigma = \frac{1}{\sqrt{2}\lambda}$. The probability is: $e^{-\sqrt{2}} \approx 0.24$.

Problem 1.18

Order of magnitude estimates:

   (a) $T_{\text{electron}} \sim 10^5 K$, $\quad T_{\text{nucleus}} \sim 1K$.

   (b) $T_{\text{helium}} \sim 1K$, $\quad T_{\text{hydrogen}} \sim 10^{-13}K$.