Answers to assigned even-numbered problems in Chapter 14

14–4: (a) \( x = (8.8 \text{ cm}) \cos(2\pi t / 0.75 \text{ s}) = (8.8 \text{ cm}) \cos[(8.38 \text{ rad/s})t] \)
   (b) \( x = -7.1 \text{ cm} \)
14–6: (a) \( \phi = \pi \text{ rad} \) (or \( -\pi \text{ rad} \))
   (b) \( \phi = \pi / 2 \) (or \( -\pi / 2 \))
   (c) \( \phi = 0 \)
   (d) \( \phi = \pi / 3 \) (or \( -\pi / 3 \))
   (e) \( \phi = 2\pi / 3 \) (or \( -2\pi / 3 \))
   (f) \( \phi = \pi / 4 \) (or \( -\pi / 4 \))
14–12: (a) \( k = 1.19 \text{ N/m} \)
   (b) \( x = (0.82 \text{ cm}) \cos[(9.11 \text{ rad/s})t - 1.02 \text{ rad}] \)
14–16: (b) \( a = -A \sin \phi, \quad b = A \cos \phi \)
14–26: (a) \( x = \pm \frac{1}{\sqrt{2}} A = \pm 0.707 A \)
   (b) \( K = \frac{3}{4} E, \quad U = \frac{1}{4} E \)
14–42: (a) \( T = 1.7 \text{ s} \)
   (b) \( T = \infty \) (no swing)
14–68: \( x = 2.9 \text{ cm} \) (lying on spring), \( x = 1.45 \text{ m} \) (jumping on spring)
14–70: (a) \( A = 0.25 \text{ m} \)
   (b) \( f = 0.875 \text{ Hz} \)
   (c) \( T = 1.14 \text{ s} \)
   (d) \( E = 0.614 \text{ J} \)
   (e) \( U = 0.098 \text{ J}, \quad K = 0.516 \text{ J} \)
14–76: (a) \( f' = 1.22 f \)
   (b) \( f'' = 0.71 f \)

Corrected answer to assigned odd-numbered problem in Chapter 14

14–3 \( f = 1.15 \text{ Hz} \)