Chapter 10 Even Answers

2. (a) 1.99×10^{-7} rad / s (b) 2.65×10^{-6} rad / s

4. (a) $t_n = \dfrac{12n}{11}$ h, n = 0, 1, 2, 3, . . ., 10 (b) only at 12:00:00

6. –226 rad / s^2

8. 50.0 rev

10. (a) 7.27×10^{-5} rad / s (b) 2.57×10^4 s (428 min)

12. $v_{\text{main rotor}} = 179 \text{ m/s} = 0.522 v_{\text{sound}}$, $v_{\text{tail rotor}} = 221 \text{ m/s} = 0.644 v_{\text{sound}}$

14. 40.0 rad / s

16. (a) 25.0 rad / s (b) 39.8 rad / s^2 (c) 0.628 s

18. $a_r = 29.4 \text{ m/s}^2$, $a_t = 9.80 \text{ m/s}^2$

20. 0.545

22. ~10^{-2} cm

24. $\dfrac{1}{160}$

26. 1.04×10^{-3} J

28. 11 $mL^2 / 12$

30. (a) $\dfrac{3}{2} MR^2$ (b) $\dfrac{7}{5} MR^2$

32. 177 kg

34. 168 N·m (clockwise)

36. 8.02 kN

38. (a) 21.6 kg · m^2 (b) 3.60 N·m (c) 52.4 rev

40. 0.312

42. (a) 56.3 J (b) 8.38 rad / s (c) 2.35 m / s (d) 1.0014 times larger

44. $\sqrt{\dfrac{(m_1 - m_2)gd}{m_1 + m_2 + \frac{1}{2}M}}$

46. 30.3 rev / s

48. 10.3 min

50. 276 J

52. (a) 0.992 W (b) 827 W

56. (a) 9.00 kg · m^2 (b) 49.3 kJ (c) –37.0 kJ

58. (a) $R / \sqrt{2}$ (b) $L\sqrt{3} / 6$ (c) $R\sqrt{2/5}$

60. –0.322 rad / s^2

62. 149 rad / s

64. (a) 2.57×10^{29} J (b) -1.63×10^{17} J / d

66. (a) $MR^2 + \dfrac{1}{3} nmR^2$ (b) $2MR^2 + \dfrac{4}{3} nmR^2$

70. (a) $\sqrt{\dfrac{2mgd \sin\theta + kd^2}{I + mR^2}}$ (b) 1.74 rad / s

74. (a) –794 N·m, –2510 N·m, 0, –1160 N·m, –2940 N·m
(b) At the following times:

12:00:00	12:30:55	12:58:19	1:32:31	1:57:01
2:33:25	2:56:29	3:33:22	3:56:55	4:32:24
4:58:14	5:30:52	6:00:00	6:29:08	7:01:46
7:27:36	8:03:05	8:26:38	9:03:31	9:26:35
10:02:59	10:27:29	11:01:41	11:29:05	