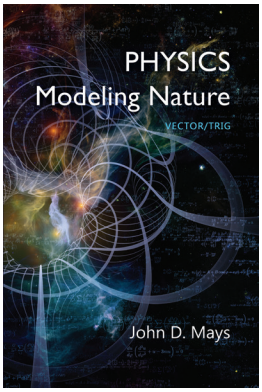
Physics: Modeling Nature



Errata

We always strive to make our textbooks as accurate as possible, but sadly, errors are a reality. We very much appreciate friends who report errata that are not included in this document!
Please send new errata to info@novarescienceandmath.com

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Physics: Modeling Nature (2015)

Chapter 1 Text

26 Example 1.2. The result of the R_y calculation should be 1.69 units, and the angle for the resultant should be 7.0°.

Chapter 1 Answers

19. magnitude = 278 km/hr

22f. $\theta = -131°$

25. $\theta = 35.1°$

27. $\theta_R = 140°$

Chapter 2 Problem correction

p. 73, #39. The time given should be 1.00 s, not 2.6 s.

Chapter 2 Answers

10. v = 0.625 m/s (0.63 m/s with 2 sig digs)

12. $v_f = 4.1$ m/s

14. d = 4.000 cm

25. t = 0.474 s (In the solutions manual, the second equation at the top of page 20 is incorrect, and should read $d_F = d_K$.)

36. $d_h = 23.4$ m

45. $\theta_p = 41.2°$

Chapter 3 Problem corrections

p. 111, #46. $m_2 = 300.0$ g

p. 111, #48. The wind should be blowing from due southeast, not southwest.

Chapter 3 Answers

17. a = –1.34 m/s2, F = –9100 N

24c. F_N = 41 N

30c. The answer given is correct, but in the solutions manual the normal force used in the solution should be F_N = 41 N.

34. d = 1.2 m, T = 8.21 N

35. d = 46 m

37a. a = 1.7m/s^2

37b. v_f = 1.4 m/s

37c. d = 0.39 m

39. a = 5.3 m/s^2, T_B = 26 N

40. a = 1.2 m/s^2

44b. T_1 = 8.29 N

44c. T_1 = 5.48 N

46. m_{max} = 220 g

Chapter 4 Answers

7d. $|\mathbf{p} \times \mathbf{E}|$ = 1.20 x 10^3 m·N

9. θ_3 = 139° (2 sig digs)

11. θ = 63°

17. F_4: 11 m·N; F_5: 3.5 m·N

18. For the 0.1450 N force on the left, torque = 0.3537 m·N; for the 0.1450 N force on the right, torque = 0.1282 m·N

28. θ = +1.4° (In the solutions manual, the numerator in the equation 4 lines from the end should have (-) not (+).)

Chapter 5 Answers

18. F = 3.81 x 10^{-13} N

22. F = 21.0 N (3 sig digs)

27. a. and b., W = 9600 J

33. W = 3400 J

36. The height should use the sine of the angle, giving vf = 5.3 m/s

53. E = 4.03329 MeV

Chapter 6 Answers

1b. 4.0 105 (kg-m)/s

3. 1.1 m/s

Chapter 7 Answers

14. $\alpha = 3.10$ rad/s^2, $s = 218$ m

15. $\theta = 25$ rev

21. $t = 0.107$ s

25. $v = 18.1$ m/s

27. $F_c = 9.60 \times 10^{-5}$ N

Chapter 8 Answers

7. $\tau = -0.000362$ m · N

10. $\alpha = 8.542$ rad/s, $\omega_f = 11.0$ rad/s, $U_K = 70.1$ J

11. $t = 8.84$ s, $\omega_f = 21.6$ rpm

15. $h = 0.0547$ m

32. In line 5 of the solution, the $-2R$ term should be $+ 2R$. This gives $r = 3.83 \times 107$ m and $R - r = 3.46 \times 108$ m. This means r is 90% of the distance from earth to the moon, and $(R - r)/r = 9.03$.

In the second part, $F_{GS} / F_{GE} = 1.77$.

Chapter 9 Answers

45. $v_0 = 509$ m/s

46. $v_c = 21$ cm/s

47. $P_{in} = 0.40$ hp

Chapter 10 Answers

1. 159.692 g/mol

2. 108 g

5. The correct atomic mass for iodine is 126.9045 g/mol, giving 2.107298×10^{-22} g/particle.

15. $V_2 = 355$ cm^3

19. $F_w = 0.0276$ N

22. $T = 295.2$ K. This gives for oxygen $v_{rms} = 4.80 \times 10^2$ m/s and for nitrogen $v_{rms} = 513$ m/s.

36. $m_w = 10.4$ g, or with 2 sig figs, 1.0×101 g.

40. Equilibrium temperature should be 38.5° C.

44. P_{duct} = 100,200 Pa

Chapter 11 Answers

9. Corrected solution:

$P = 155\ \text{kPa} = 155{,}000\ \text{Pa}$

$V_0 = 5.00\ \text{L} = 0.00500\ \text{m}^3$

$V_f = 3.00\ \text{L}$

$PV = nRT = const = P \cdot V_0 = 155{,}000\ \text{Pa} \cdot 0.00500\ \text{m}^3 = 775\ \text{Pa} \cdot \text{m}^3 = 775\ \text{J}$

$W = nRT \ln \frac{V_f}{V_0} = PV \ln \frac{V_f}{V_0} = 775\ \text{J} \cdot \ln \frac{3}{5} = -396\ \text{J}$

$\Delta U = 0$

$Q = W = -396\ \text{J}$

11. The problem statement should read: Determine the amount of work done by a system during a gas expansion from V_0 = 250 L to V_f = 350 L at constant temperature if 525 J of heat are added to the system during the process.

25. Since heat is being removed, Q is negative and ΔS = –1.23 kJ/K.

33. $W = 1.20 \times 10^2$ hp

Chapter 13 Answers

8. a = 52,900 m/s^2

11. In the solution and the diagram, replace θ everywhere with $\theta/2$.

17. $E = 2.9 \times 10^9$ N/C, θ = –11°

26. W = 1.8×10^{-14} J

34. E = 60,200 N/C

57. 97%

Chapter 14 Answers

9a. B = 0.0204 T (0.020 T with 2 sig digs)

9b. Φ_B = 9.0 mWb

10. The last line should read $\Phi_B = B \cdot A \cos\theta$, giving Φ_B = 0.83 μWb

15. Units for q/m are C/kg.

18. τ = 0.013 m · N

25. $B = 2.6 \times 10^{-5}$ T

36. $v(t)$ = (√2·240 V)sin100πt

37. $i(t) = (\sqrt{2} \cdot 1.3 \times 10^{-5}\ \text{V})\cos 2400\pi t$

51. The graph in part A should be inverted, and thus is the same as the graphs in parts b and c.

53. This represents a 75% reduction.