Corrections for Chapter 4

Page 72, right column, last two lines. "Copernicus determined its distance from the Sun
   (not the Earth) with the following argument."

Page 73, left column, line 6. After "right angle." insert: (This follows, for example, by applying
   Proposition 3.4 to the case of the circle.)

Pages 77, right column, lines 7 and 10 from the bottom, as well as page 78, left column, line 10
   from the bottom. The references to "frictionless" inclined planes and surfaces are incorrect.
   A rolling ball is subject to friction, friction being the force that produces the roll. If there were
   no friction, the ball would slide. What needs to be assumed is that friction - while rotating the
   ball - does not retard the progress of the motion in any other way (as would be the case, if the
   surface were sticky for example). See Section 9.3C.

Page 82, Figure 4.11. The point Q and its coordinate $4\frac{1}{2}$ should be moved up one unit.

Page 83,
   Figure 4.13. The coordinates of the points P_1 and P_2 should be x_1, y_1 and x_2, y_2 respectively.
   left column, bottom. The equation should be $xy^3 + y^2 - x^3 - 3 = 0$.
   right column, line 5. The equation should be $xy^3 + y^2 - x^3 - 3 = 0$.

Page 84, right column, line 4. The denominator -8 should be $2(-8)$.

Page 85, left column, line 13. The "focus $(-\frac{5}{4}, -7)$."

Page 86, Figure 4.18. $C = (x, y)$ should be $P = (x, y)$.

Page 88,
   Figure 4.21. P_β should be $P_{-\beta}$
   right column, line 13 from the bottom. Replace $y = \sin\theta$ by $\sin\theta = y$

Page 89, right column, line 6. Replace "diagonal" by "diameter"

Pages 89 and 90, Figures 4.24 and 4.25. The locations of 1 and -1 are wrong. They should be
placed at the level of the peak and trough of the curves respectively. Also, the label O for the
origin should be italicized.

Page 93, right column, last line. Change $x^2 + y^2$ to $x^2 + y_0^2$.

Page 96, right column, line 17. Delete $= (x, y)$

Page 98, Figure 4.35. The A_t should be in the middle of the region PSN rather than near the segment PS.

Page 101,

left column, line 14. It should be $\epsilon^3 = 0.00000466, \dots$, not $\epsilon^3 = 0.00000467, \dots$,

line 10 from the bottom. Insert "days" after 93

line 6 from the bottom. Winter: 88 days, 23 hours, 51 minutes

right column,

line 2. It should be $t_{ve} = 77$ days, 14 hours, 33 minutes $= 77.6063$ days

line 4. It should be $t_{ss} = 77.6063$ days $+ 92.7639$ days $= 170.3702$ days

line 8. It should be $t_{ae} = 264.0167$ days and $t_{ws} = 353.8528$ days

Page 101, right column and page 102. Redo the computations with the corrected data, e.g., with 77.6063 in place of 77.6023.

Page 102,

left column, lines 14 and 12 from the bottom. Replace 365.25 by 365.24.

left column, line 7 from the bottom. replace "semimajor" by "semiminor"

right column, lines 14, 13, and 12 from the bottom. Replace 9.690 by 9.609, 9.8528 by 9.7704, $\frac{\alpha}{2} = 84.2047°$ by $\frac{\alpha}{2} = 84.1561°$, and $\alpha = 168.4094°$ by $\alpha = 168.3122°$.

right column, line 9 from the bottom. Change "It is over 100 million miles from Earth" to "Its distance from the Earth varies from about 40 million miles (when the perihelion positions of the Earth and Mars are aligned on the same side of the Sun) to about 250 million miles (when the aphelion positions of the Earth and Mars are aligned on opposite sides of the Sun)."

Page 103, left column, lines 2 and 3 from the bottom. "Robeval" and "Willis" should read "Roberval" and "Wallis"

Page 107, Note 6. There is a $\sim$ missing in the web address. It should be http://www.nd.edu:80/$\sim$hahn/part1.html