Principles of Linear Algebra With *Maple*™
Errata

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- Page 55, the variable at the end of the last equation should be z, not w.

$$X = \begin{bmatrix} x \\ y \\ z \\ w \end{bmatrix} = \begin{bmatrix} \frac{67}{7} \\ -\frac{59}{7} \\ 0 \\ -13 \end{bmatrix} + \begin{bmatrix} \frac{1}{7} \\ -\frac{6}{7} \\ 1 \\ 0 \end{bmatrix} z$$

Thanks to Marty Person for finding this one.

- Page 188, the fourth output on this page, corresponding to the variable *znum*, has a minus sign in the wrong place. The matrix is really

$$znum := \begin{bmatrix} 5 & 13 & -8 \\ 4 & -7 & 2 \\ -1 & 11 & 0 \end{bmatrix}$$

This is purely a typographical error, and if you enter the command correctly as given, you will get the correct answer. Thanks to Marty Person for finding this one.

- Page 329, the matrix A in Homework Problem 6 is incorrect. The problem should read as:

6. Use problem 5 to show that any real matrix A of the form

$$A = \frac{1}{\sqrt{a^2+b^2}} \begin{bmatrix} a & b \\ -b & a \end{bmatrix}$$

is orthogonal if $a^2 + b^2 \neq 0$.

- Page 329, Homework Problem 7 needs to be reworded:

7. Show that every 2×2 rotational matrix, given by

$$\begin{bmatrix} \cos(\theta) & \sin(\theta) \\ -\sin(\theta) & \cos(\theta) \end{bmatrix}$$

for some angle θ, is an orthogonal matrix.

- Page 343, In Homework Problem 11 part (a), the second linear map should be S, not T.

11. (a) Let $T : \mathbb{R}^n \to \mathbb{R}^m$ and $S : \mathbb{R}^m \to \mathbb{R}^k$ be two linear maps. Show that their *composite*, $S \circ T : \mathbb{R}^n \to \mathbb{R}^k$, is also a linear map. Recall that the composite function $S \circ T : \mathbb{R}^n \to \mathbb{R}^k$ has the rule $(S \circ T)(\overrightarrow{v}) = S(T(\overrightarrow{v}))$, for all

$\overrightarrow{v} \in \mathbb{R}^n$.

- Page 418, the matrix $A_{\overrightarrow{v}}$ is not correct. The following is the correct version:

$$A_{\overrightarrow{v}} = \tag{10.38}$$

$$\begin{bmatrix} \alpha^2 + \left(1 - \alpha^2\right)\cos(\theta) & \alpha\beta - \alpha\beta\cos(\theta) + \delta\sin(\theta) & \alpha\delta - \alpha\delta\cos(\theta) - \beta\sin(\theta) \\ \alpha\beta - \alpha\beta\cos(\theta) - \delta\sin(\theta) & \beta^2 + \left(1 - \beta^2\right)\cos(\theta) & \beta\delta - \beta\delta\cos(\theta) + \alpha\sin(\theta) \\ \alpha\delta - \alpha\delta\cos(\theta) + \beta\sin(\theta) & \beta\delta - \beta\delta\cos(\theta) - \alpha\sin(\theta) & \delta^2 + \left(1 - \delta^2\right)\cos(\theta) \end{bmatrix}$$

This implies a few changes to formulas found elsewhere in this section, and the next. For instance, the equations defining $\overrightarrow{e_1}(\theta_{\overrightarrow{v}})$, $\overrightarrow{e_2}(\theta_{\overrightarrow{v}})$, and $\overrightarrow{e_3}(\theta_{\overrightarrow{v}})$ on page 418 look as follows:

For $k = 1, 2, 3$, we can break the above expression into components:

$$\overrightarrow{e_1}(\theta_{\overrightarrow{v}}) = \langle \alpha^2 + \left(1 - \alpha^2\right)\cos(\theta), \alpha\beta - \alpha\beta\cos(\theta) + \delta\sin(\theta), \alpha\delta - \alpha\delta\cos(\theta) - \beta\sin(\theta)\rangle$$
$$\overrightarrow{e_2}(\theta_{\overrightarrow{v}}) = \langle \alpha\beta - \alpha\beta\cos(\theta) - \delta\sin(\theta), \beta^2 + \left(1 - \beta^2\right)\cos(\theta), \beta\delta - \beta\delta\cos(\theta) + \alpha\sin(\theta)\rangle$$
$$\overrightarrow{e_3}(\theta_{\overrightarrow{v}}) = \langle \alpha\delta - \alpha\delta\cos(\theta) + \beta\sin(\theta), \beta\delta - \beta\delta\cos(\theta) - \alpha\sin(\theta), \delta^2 + \left(1 - \delta^2\right)\cos(\theta)\rangle$$

Please see the revised section 10.4 and 10.5 .pdf in which we revise and clarify the *Maple* code and the text. A link to the modified sections can be found on the same page at which this document was located.