4. Apostol §1.4, p. 31, Exercise # 5.
5. Apostol §1.4, p. 31, Exercise # 6.
6. Apostol §1.4, p. 31, Exercise # 7.
7. Apostol §1.8, p. 36, Exercise # 1.
8. Apostol §1.8, p. 36, Exercise # 3.
9. Apostol §1.8, p. 36, Exercise # 4.
10. Find an equation of the form $y = ax^2 + bx + c$ for the unique parabola passing through the points $(1, 1), (2, 2), \text{ and } (-1, 0)$.

11. Find the reduced row echelon form and the rank of the following matrices:

(a)

$$A = \begin{bmatrix} 3 & 1 & 1 & 1 \\ 1 & 2 & -3 & 1 \\ 2 & 1 & 0 & 3 \end{bmatrix}$$

(b)

$$B = \begin{bmatrix} 4 & 3 & 7 & 4 \\ -1 & 3 & 2 & -1 \\ 1 & 1 & 2 & 0 \end{bmatrix}$$
12. Consider the system of linear equations

\[
\begin{align*}
x - 2y + az &= 2 \\
x + y + z &= 0 \\
3y + z &= 2
\end{align*}
\]

(a) For which values of \(a\), if any, does this system have a unique solution?

(b) For which values of \(a\), if any, does this system have no solution?

(c) For which values of \(a\), if any, does this system have infinitely many solutions?

13. Consider the system of linear equations

\[
\begin{align*}
x + 2y + z &= b \\
2x + y + 2z &= 2 \\
3x + 3y + az &= 3
\end{align*}
\]

(a) For which values of \(a\) and \(b\), if any, does this system have a unique solution?

(b) For which values of \(a\) and \(b\), if any, does this system have no solution?

(c) For which values of \(a\) and \(b\), if any, does this system have infinitely many solutions?