1.2.7. The meaning of the equation $f = g$ is that $f(x) = g(x)$ for all $x \in S$. In this problem, we have $S = \{0, 1\}$. We compute:

$$\begin{aligned} f(0) &= 2.0 + 1 = 1, \\ g(0) &= 1 + 4.0 - 2.0^2 = 1, \\ f(1) &= 2.1 + 1 = 3, \\ g(1) &= 1 + 4.1 - 2.1^2 = 3. \end{aligned} \tag{1}$$

Thus, $f(0) = g(0)$ and $f(1) = g(1)$, so $f = g$.

By definition of addition of functions, $f + g$ is the function which sends an element $x \in S$ to the real number $f(x) + g(x)$. We compute:

$$\begin{aligned} (f+g)(0) &= f(0) + g(0) = 1 + 1 = 2, \\ (f+g)(1) &= f(1) + g(1) = 3 + 3 = 6, \\ h(0) &= 5^0 + 1 = 2, \\ h(1) &= 5^1 + 1 = 6. \end{aligned} \tag{2}$$

Thus, $(f + g)(0) = h(0)$ and $(f + g)(1) = h(1)$, so $f + g = h$.

1.3.5. For any $n \times n$ matrix M, let Let $M_{i,j}$ denote the entry of M in row i and column j, for $1 \leq i, j \leq n$. Then $(M^t)_{ij} = M_{ji}$ by definition, so it is immediate from the definition of symmetric matrices that M is symmetric if and only if $M_{ij} = M_{ji}$ for all $1 \leq i, j \leq n$. Now let A be an arbitrary square matrix and let n be the number of rows (or columns) of A. Then by the definition of matrix addition and the definition of A^t, we have for all $1 \leq i, j \leq n$,

$$(A+A^t)_{ij} = A_{ij} + (A^t)_{ij} = A_{ij} + A_{ji} = A_{ji} + A_{ij} = A_{ji} + (A^t)_{ji} = (A+A^t)_{ji}. \tag{3}$$

Thus, $A + A^t$ is symmetric.