1.7.1 Answers to Exercise.

1. (a) ρ_1 is $1R_1 + R_2$.
   ρ_2 is $2R_1 + R_3$.
   ρ_3 is $-2R_2 + R_1$.
   ρ_4 is $3R_2 + R_3$.
   ρ_5 is $2R_1$.

   (b) ρ_6 is $2R_2$.
   $\alpha_1 = 6$, $\alpha_2 = 2$, $\alpha_3 = 2$.

   (c) ρ_7 is $1R_3 + R_1$.
   $\beta_1 = -1$, $\beta_2 = -1$, $\beta_3 = 1$.

   (d) ρ_8 is $-1R_3 + R_2$.
   $\gamma_1 = 4$, $\gamma_2 = 0$, $\gamma_3 = 1$, $\gamma_4 = -1$.

2. (a)
$$B \xrightarrow{1R_3+R_2} \xrightarrow{2R_2+R_1} \xrightarrow{-1R_3} \xrightarrow{2R_2+R_3} \xrightarrow{2R_1+R_3} \xrightarrow{1R_1+R_2} A$$

   (b)
$$B \xrightarrow{2R_2+R_1} \xrightarrow{3R_2+R_3} \xrightarrow{2R_1+R_3} \xrightarrow{-1R_1} \xrightarrow{R_1\leftrightarrow R_2} A$$

   (c)
$$B \xrightarrow{2R_3+R_2} \xrightarrow{-2R_3+R_1} \xrightarrow{2R_2+R_1} \xrightarrow{3R_2+R_3} \xrightarrow{-2R_1+R_3} \xrightarrow{R_1\leftrightarrow R_2} A$$

   (d)
$$B \xrightarrow{1R_3+R_1} \xrightarrow{2R_2+R_1} \xrightarrow{-4R_3+R_4} \xrightarrow{R_3\leftrightarrow R_4} \xrightarrow{-3R_2+R_4} \xrightarrow{-4R_2+R_3} \xrightarrow{-1R_2} \xrightarrow{1R_1+R_4} \xrightarrow{3R_1+R_3} \xrightarrow{1R_1+R_2} A$$

3. ——

4. (a) *Comment.*
   This is no more than a careful exercise in comparing entries of matrices.

   (b) ——