1) $\det A = 99$

2) $\det A = -18k^2 + 21k + 30$
   
   It is invertible when $\det A \neq 0$. This is when $k \neq -\frac{5}{6}, 2$

3) $\det (kA) = k^n \det (A)$ because multiplying a row by a constant multiplies the determinant by that constant

4) $\pm 1$ because a permutation matrix can be transformed into the identity matrix by swapping rows and columns. The determinant of the identity matrix is 1 and swapping a row or column multiplies the determinant by $-1$

5) Reducing $A$ you get a matrix with all zeros in a row. Thus, $\det A = 0$

6) (a) $(4)(-3) = -12$
   
   (b) $5^3 \cdot 4 = 500$
   
   (c) -3

   1d) $\frac{1}{4}$

   1e) $4^3 = 64$

7) $\det A = -6$

8) $\left| \det \begin{pmatrix} \frac{1}{4} & -\frac{2}{5} & -1 \\ 0 & 2 & -1 \end{pmatrix} \right| = 15$

9) $x_1 = -1$
   
   $x_2 = 9$
   
   $x_3 = -6$

10) $\text{Adj} (A) = \begin{pmatrix} -1 & 3 & 7 \\ 0 & 0 & 5 \\ 0 & -1 & -4 \end{pmatrix}$
   
   $\det A = 5$
   
   $A^{-1} = \frac{1}{\det A} \text{Adj} (A)$