

Find the inverses of the following matrices. Check your work by multiplying your result with the original matrix. You may want to try both row-reduction and Cramer's rule (the one that's similar to finding the derivative) to see which one you like more. You'll have to deal with some fractions in most of these, but they shouldn't be too bad.

$$\begin{pmatrix} -9 & -1 & 0 \\ 3 & -5 & 2 \\ -3 & 3 & -1 \end{pmatrix}, \quad \begin{pmatrix} 3 & -5 & 7 \\ -1 & -2 & 4 \\ -6 & 5 & -5 \end{pmatrix}, \quad \begin{pmatrix} 3 & -4 & 1 \\ -2 & 3 & 1 \\ -6 & 5 & -3 \end{pmatrix}, \quad \begin{pmatrix} -3 & -4 & 6 \\ -5 & 4 & 1 \\ 0 & 2 & -2 \end{pmatrix},$$

$$\begin{pmatrix} 4 & 2 & -5 \\ -2 & 6 & -7 \\ -5 & 5 & -4 \end{pmatrix}, \quad \begin{pmatrix} 0 & 6 & -3 \\ 1 & 5 & -1 \\ -3 & 2 & -7 \end{pmatrix}, \quad \begin{pmatrix} 2 & -2 & 0 \\ 5 & 2 & 6 \\ 5 & 0 & 4 \end{pmatrix}, \quad \begin{pmatrix} 2 & 9 & 7 \\ 1 & -8 & -3 \\ -3 & -2 & -5 \end{pmatrix},$$

$$\begin{pmatrix} 1 & 5 & 5 \\ -1 & -4 & 0 \\ -2 & -7 & 4 \end{pmatrix}, \quad \begin{pmatrix} 2 & -7 & -9 \\ -1 & 3 & 5 \\ -2 & 4 & 1 \end{pmatrix}, \quad \begin{pmatrix} -3 & -7 & -7 \\ 1 & 2 & 2 \\ 5 & 1 & 0 \end{pmatrix}, \quad \begin{pmatrix} 1 & 1 & -5 \\ -1 & -4 & 7 \\ 2 & 0 & -7 \end{pmatrix}.$$

Here are some 4×4 matrices. These will obviously take longer to invert.

$$\begin{pmatrix} -4 & -1 & -6 & 1 \\ 4 & 3 & -8 & 4 \\ 9 & 6 & -2 & 4 \\ 0 & 8 & -4 & 5 \end{pmatrix}, \quad \begin{pmatrix} -5 & 0 & -4 & -6 \\ -7 & -3 & -5 & 5 \\ 5 & 7 & 1 & -1 \\ 2 & -1 & 2 & 4 \end{pmatrix},$$

$$\begin{pmatrix} -5 & 9 & 7 & -4 \\ -9 & 1 & -3 & -3 \\ -6 & 4 & 0 & -4 \\ -4 & 2 & 0 & -2 \end{pmatrix}, \quad \begin{pmatrix} -9 & -5 & 2 & -8 \\ -2 & 3 & 3 & 0 \\ 7 & 0 & 3 & 5 \\ 1 & 6 & 0 & 3 \end{pmatrix}.$$