

# Crack the Code

# Inverse of a $2 \times 2$ Matrix

<b>A</b>	The inverse of $\begin{pmatrix} 9 & 2 \\ 4 & 1 \end{pmatrix}$ is $\begin{pmatrix} \boxed{1} & -2 \\ -4 & \boxed{9} \end{pmatrix}$	<b>B</b>	The inverse of $\begin{pmatrix} 5 & -2 \\ -7 & 3 \end{pmatrix}$ is $\begin{pmatrix} \boxed{3} & 2 \\ \boxed{7} & 5 \end{pmatrix}$
<b>C</b>	The inverse of $\begin{pmatrix} -2 & -3 \\ 4 & 5 \end{pmatrix}$ is $\begin{pmatrix} 2.5 & 1.5 \\ \boxed{-2} & \boxed{-1} \end{pmatrix}$	<b>D</b>	The inverse of $\begin{pmatrix} 6 & -2.5 \\ -7 & 3 \end{pmatrix}$ is $\begin{pmatrix} \boxed{6} & 5 \\ \boxed{14} & \boxed{12} \end{pmatrix}$
<b>E</b>	Given that $\mathbf{A} = \begin{pmatrix} -5 & -2 \\ 10 & 3 \end{pmatrix}$ $\mathbf{A}^{-1} = \frac{1}{\boxed{5}} \begin{pmatrix} \boxed{3} & \boxed{2} \\ -10 & -5 \end{pmatrix}$	<b>F</b>	Given that $\mathbf{B} = \begin{pmatrix} -3 & -2 \\ 9 & 7 \end{pmatrix}$ $\mathbf{B}^{-1} = \frac{1}{\boxed{3}} \begin{pmatrix} -7 & -2 \\ \boxed{9} & \boxed{3} \end{pmatrix}$
<b>G</b>	The inverse of $\begin{pmatrix} -0.5 & 1.5 \\ 4 & -9 \end{pmatrix}$ is $\begin{pmatrix} \boxed{6} & \boxed{1} \\ \frac{8}{3} & \frac{1}{3} \end{pmatrix}$	<b>H</b>	The inverse of $\begin{pmatrix} -3 & 4 \\ 1 & 2 \end{pmatrix}$ is $\frac{1}{\boxed{10}} \begin{pmatrix} -2 & 4 \\ 1 & \boxed{3} \end{pmatrix}$
<b>I</b>	The matrix $\begin{pmatrix} -3 & 4 \\ a & 3 \end{pmatrix}$ is self-inverse. Find the value of $a$ . $a = -2$	<b>J</b>	The matrix $\begin{pmatrix} -9 & -10 \\ a & b \end{pmatrix}$ is self-inverse. Find the values of $a$ and $b$ . $a = 8, b = 9$
<b>K</b>	Given $\mathbf{A} = \begin{pmatrix} -3 & 1 \\ 0 & -1 \end{pmatrix}$ and $\mathbf{B} = \begin{pmatrix} 2 & 4 \\ -1 & 1 \end{pmatrix}$ , $(\mathbf{AB})^{-1} = \frac{1}{\boxed{15}} \begin{pmatrix} -1 & \boxed{8} \\ \boxed{-1} & -7 \end{pmatrix}$	<b>L</b>	Given $\mathbf{A} = \begin{pmatrix} -1 & -3 \\ -2 & 5 \end{pmatrix}$ and $\mathbf{B} = \begin{pmatrix} 5 & -3 \\ 3 & -2 \end{pmatrix}$ , $\mathbf{B}^{-1}\mathbf{A}^{-1} = \begin{pmatrix} \boxed{4} & \boxed{-3} \\ \boxed{5} & -4 \end{pmatrix}$

To get the three-digit code, add together all the numbers  
in the boxes. **137**