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**Exercise 1** (8 points)

Use the variation of parameters method to solve the system  $X' = \begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix} X + \begin{pmatrix} t \\ 1 \end{pmatrix}$

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**Exercise 2** (7 points)

Use exponential matrix to solve the system  $X' = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 0 \\ 1 & 0 & 0 \end{bmatrix} X$

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**Exercise 1** (8 points)

Use the variation of parameters method to solve the system  $X' = \begin{pmatrix} 2 & 2 \\ 2 & 2 \end{pmatrix} X + \begin{pmatrix} 1 \\ t \end{pmatrix}$

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**Exercise 2** (7 points)

Use exponential matrix to solve the system  $X' = \begin{bmatrix} 0 & 2 & 0 \\ 0 & 0 & 0 \\ 2 & 0 & 0 \end{bmatrix} X$

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**Exercise 1** (8 points)

Use the variation of parameters method to solve the system  $X' = \begin{pmatrix} 3 & 3 \\ 3 & 3 \end{pmatrix} X + \begin{pmatrix} 2 \\ t \end{pmatrix}$

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**Exercise 2** (7 points)

Use exponential matrix to solve the system  $X' = \begin{bmatrix} 0 & -1 & 0 \\ 0 & 0 & 0 \\ -1 & 0 & 0 \end{bmatrix} X$