

**Exercise sheet 11 for Math 263: ODEs for Engineers** Matt Roberts  
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Define

$$A = \begin{pmatrix} 1 & 2 \\ -2 & 3 \end{pmatrix}.$$

1. Find the determinant of  $A - 2I$ .
2. Calculate the eigenvalues, and then the eigenvectors, of  $A$ .
3. Write out the general solution to

$$\frac{d\mathbf{x}}{dt} = A\mathbf{x}.$$

If you spot any errors, please inform me: [matthew.roberts@mcgill.ca](mailto:matthew.roberts@mcgill.ca)