

## Matrix Algebra Exercises

For the following matrices

$$A = \begin{pmatrix} 3 & 0 & -1 \\ 2 & 1 & 0 \end{pmatrix}$$

$$B = (2 \quad 4 \quad 0 \quad -1)$$

$$C = \begin{pmatrix} 3 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & -2 \end{pmatrix}$$

$$D = \begin{pmatrix} 1 & 4 \\ 0 & -2 \\ 5 & 1 \\ 2 & 3 \end{pmatrix}$$

$$E = \begin{pmatrix} -1 \\ 6 \end{pmatrix}$$

$$F = (3)$$

$$G = \begin{pmatrix} 2 & 0 & 3 \\ 1 & -1 & 2 \end{pmatrix}$$

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

1. Where it is possible, find  $A + B$ ,  $A + G$ .
2. Where it is possible, find  $A - B$ ,  $A - G$ .
3. Where possible, find  $AB$ ,  $CA$ ,  $FG$ ,  $DG$ ,  $CD$ ,  $DE$ .
4. Where possible, find  $G^2$ ,  $H^2$ ,  $F^2$ ,  $E^2$ ,  $H^2$ ,  $H^3$ .