

## Reading Questions 13

page 156: example 7

1. The matrix  $\begin{bmatrix} 3 & 0 \\ 0 & 2 \end{bmatrix}$  is similar to the matrix  $\begin{bmatrix} 2 & 0 \\ 0 & 2 \end{bmatrix}$ .
2. If  $\begin{bmatrix} 3 & 0 \\ 0 & 1 \end{bmatrix}$  is similar  $\begin{bmatrix} 2 & 1 \\ 0 & 1 \end{bmatrix}$  then  $\begin{bmatrix} 4 & 0 \\ 0 & 1 \end{bmatrix}$  is similar to  $\begin{bmatrix} 4 & 2 \\ 0 & 1 \end{bmatrix}$ .
3. Suppose  $A = SBS^{-1}$  where  $A = \begin{bmatrix} 2 & 0 \\ 0 & 2 \end{bmatrix}$ . What is  $B$ ?

## Section 3.4 Coordinates (Part 2)

### The coordinate vector

- P 1.** Write down what it means for two matrices to be similar.
- P 2.** If  $A$  is similar to the identity matrix what can you say about  $A$ ?
- P 3.** Let

$$A = \begin{bmatrix} 2 & 0 \\ 0 & 3 \end{bmatrix} \quad \text{and} \quad B = \begin{bmatrix} 2 & 1 \\ 0 & 3 \end{bmatrix}.$$

Find an invertible matrix  $S$  such that  $AS = SB$ .

- P 4.** Suppose  $\begin{bmatrix} 1 & 2 \\ 4 & 3 \end{bmatrix} = S \begin{bmatrix} 5 & 0 \\ 0 & -1 \end{bmatrix} S^{-1}$ . Find a matrix  $C$  which is similar to  $\begin{bmatrix} 9 & 8 \\ 16 & 17 \end{bmatrix}$ .