Diagonalisation and applications

TOTAL POINTS 7

1.Question 1

In this quiz you will diagonalise some matrices and apply this to simplify calculations.

Given the matrix *T*=[[6 -1], [2 3]] and change of basis matrix *C*=[[1 1], [1 2]] (whose columns are eigenvectors of *T*), calculate the diagonal matrix *D*=*C*^(−1)*TC*.

1 / 1 point

[[5 0], [0 4]]

2.Question 2

Given the matrix *T*=[[2 7], [0 −1]] and change of basis matrix *C*=[[7 1], [−3 0]] (whose columns are eigenvectors of *T*), calculate the diagonal matrix *D*=*C*^(−1)*TC*.

1 / 1 point

[[−1 0], [0 2]]

3.Question 3

Given the matrix *T*=[[1 0], [2 −1]] and change of basis matrix *C*=[[1 0], [1 1]] (whose columns are eigenvectors of *T*), calculate the diagonal matrix *D*=*C*^(−1)*TC*

1 / 1 point

[[1 0], [0 -1]]

4.Question 4

Given a diagonal matrix *D*=[[*a* 0], [0 *a*]], and a change of basis matrix *C*=[[1 2], [0 1]] with inverse *C*=[[1 -2], [0 1]], calculate *T*=*CDC*^(−1).

1 / 1 point

[[*a* 0], [0 *a*]]

5.Question 5

Given that *T*=[[6 -1], [2 3]]=[[1 1], [1 2]][[5 0], [0 4]][[2 −1], [−1 1]], calculate T^3.

1 / 1 point

- [[186 -61], [122 3]]

6.Question 6

Given that *T*=[[2 7], [0 −1]]= [[7 1], [−3 0]][[−1 0], [0 2]][[0 −1/3], [1 7/3]], calculate T^3.

1 / 1 point

- [[8 21], [0 -1]]

7.Question 7

Given that *T*=[[1 0], [2 −1]]= [[1 0], [1 1]][[1 0], [0 −1]][[1 0], [−1 1]], calculate T^5.

1 / 1 point

- [[1 0], [2 -1]]