Matrices

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## Questions

1. Calculate the following:
   1. +
   2. +

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1. For the matrix find:
2. For the matrix find:
3. Given that for a matrix , find:

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1. By finding the inverse of a matrix, solve the following systems of simultaneous equations:

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## Answers

1. Calculate:
   1. =

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1. For the matrix we have:
   1. =
   2. = =
   3. Using the identity matrix method:

This gives us two systems off simultaneous equations, which we need to solve:

(1)

(2)

(2) + 7 (1) :

Therefore, , which gives us

(3)

(4)

(4) + 7 (3) :

Therefore, , which gives us .

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So, we have

* 1. = (
  2. =
  3. = 2 + 7 = 9

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1. For the matrix , we have:
   1. =
   2. Using the augmented matrix method:

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Therefore,

* 1. =
  2. =

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* 1. = 1 + 3 + 7 = 11

1. Given that for a matrix , find:
   1. = = =
   2. =
   3. = = =
   4. = = =

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1. By finding the inverse of a matrix, solve the following systems of simultaneous equations:

We can put these equations into the format :

We then find (using any appropriate method, this example uses the augmented matrix method):

Therefore, .

We can then rearrange to get , which gives , and so :

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So, the solution is ,

We find the inverse of , using the augmented matrix method:

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Therefore, .

We then find

And so:

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