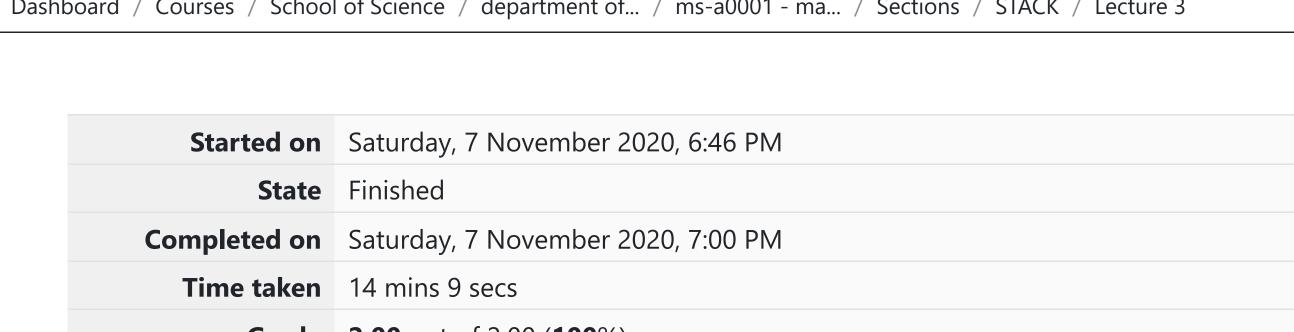
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Grade 2.00 out of 2.00 (100%) Question 1 Mark 1.00 out of 1.00 Correct

5B =

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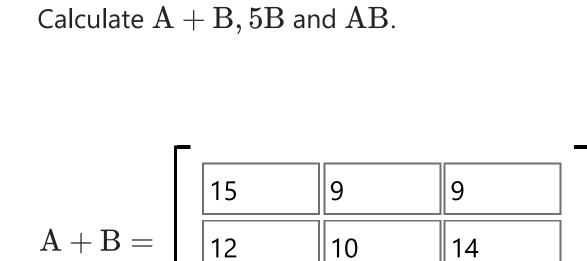
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Your last answer was interpreted as follows:

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	L 14	7	$14 \rfloor$	
Your last	answer	was	interprete	d as
follows:			•	

138 AB =

25

35

40

45

Your last answer was interpreted as

follows:
$$\begin{bmatrix} 122 & 74 & 138 \\ 114 & 57 & 120 \\ 92 & 44 & 96 \end{bmatrix}$$

Your answer is correct! Your answer is correct! The matrix sum is correct. Marks for this submission: 0.33/0.33. Your answer is correct! Your answer to 5B is correct. Marks for this submission: 0.33/0.33. Your answer is correct! Your answer to AB is correct. Marks for this submission: 0.33/0.33. **Worked solution:** $A + B = \begin{bmatrix} 8+7 & 8+1 & 7+2 \\ 2 \cdot 6 & 7+3 & 8+6 \\ 9+5 & 5+2 & 9+5 \end{bmatrix} = \begin{bmatrix} 15 & 9 & 9 \\ 12 & 10 & 14 \\ 14 & 7 & 14 \end{bmatrix}.$ $5B = 5\begin{bmatrix} 7 & 1 & 7 \\ 6 & 7 & 8 \\ 9 & 5 & 9 \end{bmatrix} = \begin{bmatrix} 5 \cdot 7 & 5 \cdot 1 & 5 \cdot 7 \\ 5 \cdot 6 & 5 \cdot 7 & 5 \cdot 8 \\ 5 \cdot 9 & 5 \cdot 5 & 5 \cdot 9 \end{bmatrix} = \begin{bmatrix} 35 & 5 & 35 \\ 30 & 35 & 40 \\ 45 & 25 & 45 \end{bmatrix}.$ $AB = \begin{bmatrix} 8 & 8 & 2 \\ 6 & 3 & 6 \\ 5 & 2 & 5 \end{bmatrix} \begin{bmatrix} 7 & 1 & 7 \\ 6 & 7 & 8 \\ 9 & 5 & 9 \end{bmatrix} = \begin{bmatrix} 8 \cdot (7) + 8 \cdot (6) + 2 \cdot (9) & 8 \cdot (1) + 8 \cdot (7) + 2 \cdot (5) & 8 \cdot (7) + 8 \\ 6 \cdot (7) + 3 \cdot (6) + 6 \cdot (9) & 6 \cdot (1) + 3 \cdot (7) + 6 \cdot (5) & 6 \cdot (7) + 3 \\ 5 \cdot (7) + 2 \cdot (6) + 5 \cdot (9) & 5 \cdot (1) + 2 \cdot (7) + 5 \cdot (5) & 5 \cdot (7) + 2 \end{bmatrix}$ A correct answer is $\begin{bmatrix} 15 & 9 & 9 \\ 12 & 10 & 14 \\ 14 & 7 & 14 \end{bmatrix}$. A correct answer is 30 35 40 .

Question **2** Flag question Mark 1.00 out of 1.00 Correct

Let
$$A=\begin{bmatrix}2&0&2\\1&2&2\\3&1&3\end{bmatrix}$$
 and $B=\begin{bmatrix}3&1&0\\2&1&4\\2&4&2\end{bmatrix}$. Calculate $AB-BA$. What can we deduce if $AB-BA=0$?

Answer:

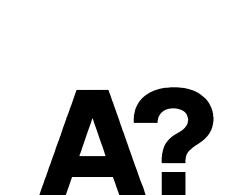
follows:

Your last answer was interpreted as

Your answer is correct! Marks for this submission: 1.00/1.00. **Worked solution:** $\lceil 2 \cdot 3 + 0 \cdot 2 + 2 \cdot 2 \quad 2 \cdot 1 + 0 \cdot 1 + 2 \cdot 4 \quad 2 \cdot 0 + 0 \cdot 4 + 2 \cdot 2 \rceil$ $= 1 \cdot 3 + 2 \cdot 2 + 2 \cdot 2 \quad 1 \cdot 1 + 2 \cdot 1 + 2 \cdot 4 \quad 1 \cdot 0 + 2 \cdot 4 + 2 \cdot 2$ $\begin{bmatrix} 3 \cdot 3 + 1 \cdot 2 + 3 \cdot 2 & 3 \cdot 1 + 1 \cdot 1 + 3 \cdot 4 & 3 \cdot 0 + 1 \cdot 4 + 3 \cdot 2 \end{bmatrix}$ $\begin{bmatrix} 10 & 10 & 4 \end{bmatrix}$ = 11 11 12 $\lfloor 17 \quad 16 \quad 10 \rfloor$ $\lceil 3 \cdot 2 + 1 \cdot 1 + 0 \cdot 3 \quad 3 \cdot 0 + 1 \cdot 2 + 0 \cdot 1 \quad 3 \cdot 2 + 1 \cdot 2 + 0 \cdot 3 \rceil$ $= 2 \cdot 2 + 1 \cdot 1 + 4 \cdot 3 \quad 2 \cdot 0 + 1 \cdot 2 + 4 \cdot 1 \quad 2 \cdot 2 + 1 \cdot 2 + 4 \cdot 3$ = 17 6 18
14
10
18
 $\begin{bmatrix} 10-7 & 10-2 & 4-8 \end{bmatrix}$ = 11-17 11-6 12-18 $\begin{bmatrix} 17 - 14 & 16 - 10 & 10 - 18 \end{bmatrix}$ Matrix AB-BA is called the commutator of A and B. If the commutator equals zero the product of the matrices commutes and if it is nonzero the matrices do not commute. In other words AB = BA iff AB - BA = 0. A correct answer is $\begin{bmatrix} 3 & 8 & -4 \\ -6 & 5 & -6 \\ 3 & 6 & -8 \end{bmatrix}$.

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◄ Lecture 2 Lecture 4 ►



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