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()

7.3.5 Properties

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■ Calculator

Week 7 due Nov 20, 2023 01:42 IST

7.3.5 Properties

Reading

0 points possible (ungraded)
Read Unit 7.3.5 of the notes. [LINK]





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✓ Correct

Homework 7.3.5.1

1/1 point (graded)

Let $\alpha \neq 0$ and B have an inverse. Then

$$(\alpha B)^{-1}=rac{1}{lpha}B^{-1}.$$

True



Answer: True

Answer: True

$$(\alpha B)(\frac{1}{\alpha}B^{-1}) = \alpha B \frac{1}{\alpha}B^{-1} = \underbrace{\alpha \frac{1}{\alpha}}_{1} \underbrace{BB^{-1}}_{I} = I.$$

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Answers are displayed within the problem

Homework 7.3.5.2

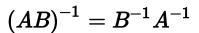
1/1 point (graded)

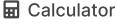
Which of the following is true regardless of matrices A and B (as long as they have an inverse and are of the same size)?



$$(AB)^{-1} = A^{-1}B^{-1}$$







$$(AB)^{-1} = B^{-1}A$$

$$(AB)^{-1} = B^{-1}$$



Answer: (b)

$$(AB)(B^{-1}A^{-1}) = A \ \underbrace{(BB^{-1})}_{I} \ A^{-1} = \ \underbrace{AA^{-1}}_{I} \ = I.$$

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Homework 7.3.5.3

1/1 point (graded)

Let square matrices A, B, and C have inverses A^{-1} , B^{-1} , and C^{-1} , respectively. Then

$$(ABC)^{-1} = C^{-1}B^{-1}A^{-1}.$$

Always

Answer: Always

Answer: Always

$$(ABC)(C^{-1}B^{-1}A^{-1}) = AB \ \underbrace{(CC^{-1})}_{I} \ B^{-1}A^{-1} = A \ \underbrace{(BB^{-1})}_{I} \ A^{-1} = \ \underbrace{AA^{-1}}_{I} \ = I.$$

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Homework 7.3.5.4

1/1 point (graded)

Let square matrix A have inverse A^{-1} . Then $(A^T)^{-1} = (A^{-1})^T$.

Always

Answer: Always

Answer: Always

$$A^{T}(A^{-1})^{T} = (\underbrace{A^{-1}A}^{T})^{T} = I^{T} = I$$

Since $(A^{-1})^T = (A^T)^{-1}$, we will often write A^{-T} .

■ Calculator

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Homework 7.3.5.5

1/1 point (graded)

$$\left(A^{-1}\right)^{-1} = A$$

Always

✓ Answer: Always

Answer: Always

$$(A^{-1})^{-1}A^{-1} = (AA^{-1})^{-1} = I^{-1} = I$$

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