ICMA 223 Linear Algebra A

Problem Set 8

Problem 0 (10 points)

Please provide the following information. Please refer to the "General Information" section above for details.

(a) What is your full name (first name and last name)?

(b) What is your student ID number?

(c) Which section are you a student of, Section 1 or Section 2?

(d) Please write the list of your collaborators for this problem set.

(e) Please write the list of sources you consult for this problem set.

<u>Optional</u>: what is your nickname (if you have one)?

PROBLEM 1 (30 points)

Read the lecture notes for the eighth week.

Write one short paragraph (just 3 - 5 sentences is enough!) about the reading. Your paragraph can be, for example, something you find interesting or confusing about what you read, or some questions you have from the reading, or it can be where you work out an explicit example of some result from the notes, or it can even be other things you would like to write about which are related to the reading!

PROBLEM 2 (30 points)

Let

$$
A := \begin{bmatrix}
11 & 3 & -9 & 29 & 35 \\
4 & 0 & -32 & 7 & -2 \\
0 & 0 & -3 & 0 & 0 \\
4 & 0 & -5 & 1 & 3 \\
-4 & 0 & 10 & 0 & 5
\end{bmatrix}.
$$

Evaluate $\det(A)$.

PROBLEM 3 (30 points)

Let A and B be real square matrices of the same dimension. Suppose that

$$
\begin{aligned}
\det(\mathrm{adj}(A \cdot B)) &= 4^{18}, \\
\det(\mathrm{adj}(\mathrm{adj}(A)) \cdot B^2) &= 4^{47}, \text{ and} \\
\det(\mathrm{adj}(\mathrm{adj}(B))) &= 4^9.
\end{aligned}
$$

What is the positive integer m such that $\mathrm{tr}(\mathrm{adj}(A^2 \cdot B) \cdot A^2 \cdot B) = m^m$?

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