Homework 4

Color Scheme: Blue problems are graded, orange and red are not. In fact, don't turn in orange and red ones, but *you should try to solve them for yourselves, as exercises.*

Graded	Important	Routine

Groups for this homework: same as Homework 1,

(1) Ahmed Alenezi, Yiting Song, Elliot Spears
(2) Athbi Aljadi, Rod Jafari, Baraka Kombe-Jarvis
(3) Alexa Graffeo, Nathan Lowe, Jade Vanausdall
(4) Tristan Hanna, Alexander Straiting, Michelle Maclennan
(5) Aaron Hong, John Vander Dussen, Yi Xu
(6) Brady Itkin, Bryan Nelson, Aaron Mutchler

Problems:

- Show that for all $A, B \in M_n(\mathbb{R})$, we have
  (1) $\det(AB) = \det(BA)$ (This is problem 5b in Section 3.3.)
  (2) $\det(BAB^{-1}) = \det A$ if $B \in \mathrm{GL}(n, \mathbb{R})$
  (3) $\mathrm{tr}(BAB^{-1}) = \mathrm{tr}\, A$ if $B \in \mathrm{GL}(n, \mathbb{R})$
- Section 3.3: 7a, 8ab, 9c, 13cde (similarity is an equivalence relation on $M_n(\mathbb{R})$) and 13g is problem (2) above (the determinant is an invariant of the similarity classes), 6b, 9ab
- Section 4.1: 6, 14, 13a, 4, 13bc, 15