

THREE ROOTS

Consider the equation

$$Ax^3 + (2 - A)x^2 - x - 1 = 0,$$

where A is a real number for which the equation has three real roots, not necessarily distinct. For certain values of A , there is a repeated root r and a distinct root s . List all such values of the triple (A, r, s) .

RULES

- (1) You must be an undergraduate enrolled in classes at USC-Columbia.
- (2) Write your solutions clearly and show all of your work.
- (3) Staple all sheets together.
- (4) Bring your solutions to the math office (LC 411) and drop it in the box provided.
- (5) **Include your name and email address.**
- (6) Sign the drop-off sheet to record your submission.

Look for a new problem on the 15th of every month!