

**CURMath**  
**Problem of the Week**  
Department of Mathematics and Statistics

**Problem # 310**

**Posted on: October 21, 2019**

**Due on: October 28, 2019**

Find all real valued functions  $f(x)$  with domain  $x \neq 0$  that satisfy

$$x^2 f\left(\frac{x}{2}\right) - f\left(\frac{2}{x}\right) = 1 .$$

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**Rules**

1. Anyone is eligible to participate. Each solution is to be the work of one individual without any input from faculty or others. An answer must be accompanied by appropriate justification to be considered correct.
2. The solution is to be submitted with the solver's name, email, year in school and local phone number. If you are submitting this for possible credit in a class, include your class number and instructor's name.
3. The solution is to be typed or legibly written. Solutions must be submitted to the Mathematics and Statistics Department Office (Lincoln 501) by **4:00 p.m. on the due date**.
4. Entries will be graded on clarity of exposition and elegance of solution. An award of \$15 will be given for the **best correct** solution by a YSU undergraduate student. In the case of a two-way tie, each award winner will receive \$10. If there are more than two best solutions, a drawing will be held to determine two award winners.
5. Graduate students and faculty are encouraged to submit solutions, but they will not be considered for the monetary award.
6. Names of all undergraduate solvers will be posted across from the Mathematics and Statistics Department Office and in the Undergraduate Student Lounge (Lincoln 638) within one week of the due date. After the solutions are reviewed, students can retrieve their submitted solution, with grader comments, at the Department Office (Lincoln 501).