APPM 2350—Exam 3

Wednesday, Nov 17th 6:30pm-8pm 2021

This exam has 5 problems. Please start each new problem at the top of a new page in your blue book. Show all your work in your blue book and simplify your answers. Answers with no justification will receive no points. You are allowed one 8.5×11-in page of notes (ONE side). NO calculators, smartphones/watches, or

Problem 5 (17 points)
A neighborhood sits in the region in the xy-plane given by

$$x^2 + y^2 \quad 4 \text{ and } x \quad 1$$

(where distances in the xy-plane are measured in miles). An earthquake occurs with epicenter at the origin. Suppose at each point in the neighborhood, the energy density released from the earthquake is given by the function

$$E(x;y) = \frac{10^6}{(d(x;y))^3} \qquad \frac{joules}{miles^2}$$

where $d(x;y)$ is the distance from $(x;y)$ to the epicenter.
Find the total amount of energy (in joules) released by the earthquake in this neighborhood.

End Of Exam