I-A5c *Last Practice Assessment!!!*

Let R be the first-quadrant region bounded by the graphs of $y = \sqrt{x}$ and $y = \frac{x}{2}$

1. R is the base of a solid whose cross sections perpendicular to the x-axis are isosceles right triangles with a leg in R. Find the volume of this solid.

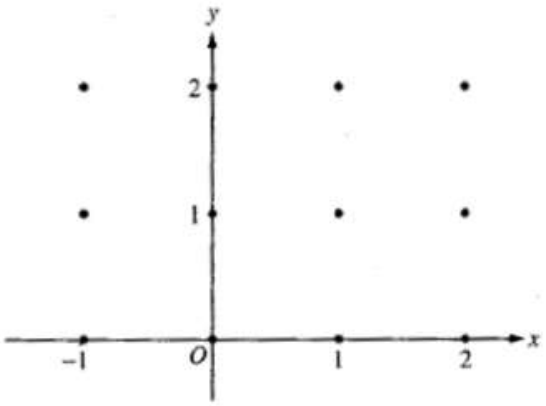
2. R is the base of a second solid whose cross sections perpendicular to the y-axis are semicircles. Find the volume of this solid.

[NOTE: Be ready for either dx or dy problems involving: squares, semicircles, rectangles with defined height, isosceles triangles with a leg or hypotenuse in the plane.]

D-DE4

Consider the differential equation $\frac{dy}{dx} = \frac{x-1}{y^2}$

3. On the axes provided, sketch a slope field at the 12 points indicated (when possible).



4. While only some points are graphed, the slope field for #3 is defined for many others. Describe all points in the xy-plane that have negative slope.

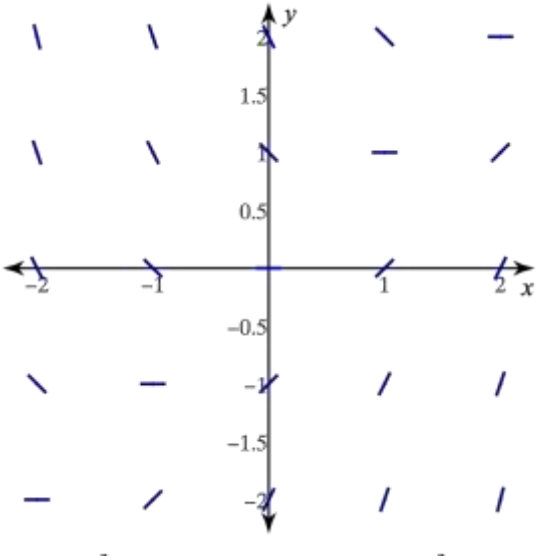
5. Choose the differential equation that could be represented by the given slope field.

A) $\frac{dy}{dx} = \frac{x}{y}$

B) $\frac{dy}{dx} = xy$

C) $\frac{dy}{dx} = x - y$

D) $\frac{dy}{dx} = x + y$



D-DE1

6. An illness is spreading through a population of N people. Let R represent the number of people with the illness. The rate with respect to time of people with the illness is growing is directly proportional to the product of the number of people with the illness and the square root of the population size. Write a differential equation that models this situation.

D-DE3:

7. Consider the differential equation $y' = 2y - 3$. Find the general solution y.

D-DE2: Consider the differential equation $\frac{dy}{dx} = 4y^2x$

8. Find the particular solution with initial condition $(1,\frac{1}{3})$