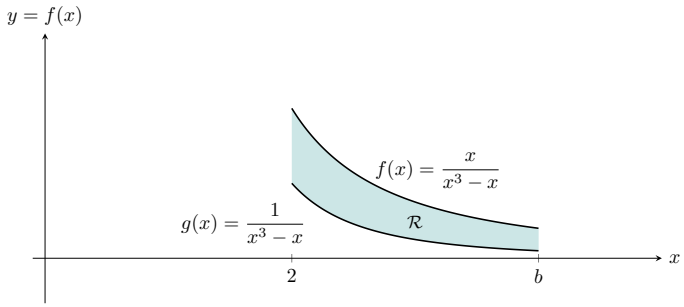
Name: _____ Sort #: _____

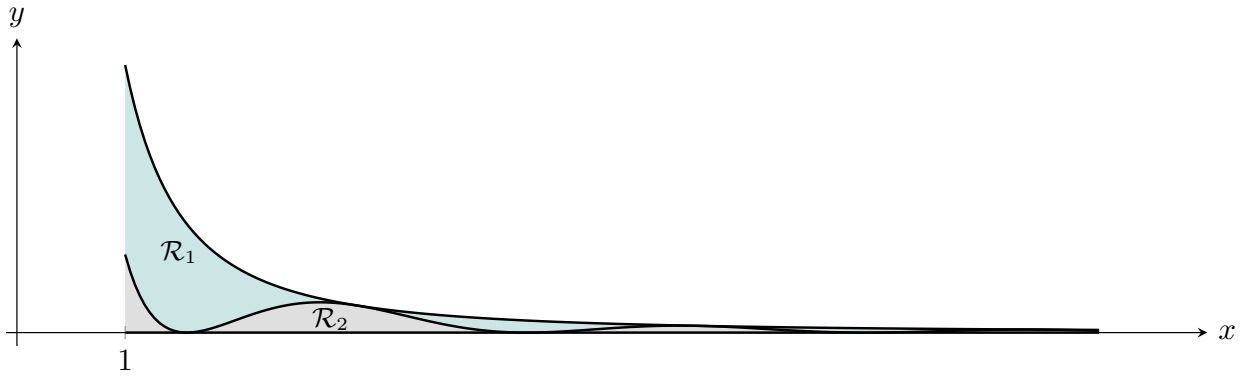
Written Homework 3

MATH 2205: Calculus II, Fall 2018 Page ____ of ____

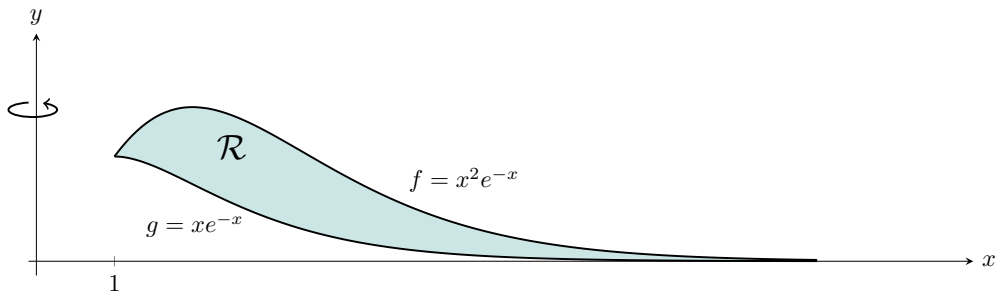
Problem 1: Find the area of the region $\mathcal{R}$ indicated in the picture. Use that result to determine the limit of the area of $\mathcal{R}$ as b goes to infinity.



Problem 2: Let $\mathcal{R}_1$ be the infinite region between the x-axis and the curve $y = x^{-2}$ on the interval $[1, \infty)$. Let $\mathcal{R}_2$ be the infinite region between the x-axis and the curve $y = x^{-2}\cos^2(x)$ on the interval $[1, \infty)$. What can you conclude about the area of $\mathcal{R}_2$ based on its relationship to the area of $\mathcal{R}_1$? (Note: you do not need to calculate the area of $\mathcal{R}_2$ explicitly, just establish the relationship between $\mathcal{R}_1$ and $\mathcal{R}_2$).



Problem 3: Compute the area of the region $\mathcal{R}$ bounded by the curves $f = x^2e^{-x}$ and $g = xe^{-x}$ on the interval $[1, \infty)$.



Problem 4: Consider the infinite region $\mathcal{R}$ in the first quadrant bounded by the x-axis and the curve $y = \dfrac{\ln(x)}{x^2}$ on the interval $[1, \infty)$. Compute the volume of the solid obtained when $\mathcal{R}$ is revolved about the y-axis.