



5. Let R be the shaded region bounded by the graph of $y = xe^{x^2}$, the line $y = -2x$, and the vertical line $x = 1$, as shown in the figure above.
- Find the area of R .
 - Write, but do not evaluate, an integral expression that gives the volume of the solid generated when R is rotated about the horizontal line $y = -2$.
 - Write, but do not evaluate, an expression involving one or more integrals that gives the perimeter of R .