Practice Assessment 4
Area Between Curves

These **practice problems** are designed to help you **prepare for our course exams** and **assess your understanding** of the course material at the expected level. Aim to complete them **in class, during tutoring, office hours, or on your own**, and try to solve them **without notes or a calculator**, just like on the **actual exams**. Remember, **practice makes perfect**, so don't hesitate to **ask for help** if you get stuck.

1. For each of the following problems, graph the equations and shade the area of the region between the curves. Determine its area by integrating over the x-axis.

    (a) $y = x^2$ and $y = -x^2 + 18x$

    (b) $y = e$, $y = e^x$, and $y = e^{-x}$.

2. For each of the following problems, graph the equations and shade the area of the region between the curves. If necessary, break the region into sub-regions to determine its entire area.

   (a) $y = 12 - x$, $y = \sqrt{x}$, and $y = 1$

   (b) $y = x^3$ and $y = x^2 - 2x$ over $x \in [-1, 1]$.

3. For each of the following problems, graph the equations and shade the area of the region between the curves. Determine its area by integrating over the y-axis.

(a) $y = x^3$ and $x = 3y - 2$

(b) $x = |y|$ and $2x = -y^2 + 2$.