MATH 1710 Tutorial 2

In Problems 1–3, use definite integrals to find the areas bounded by the curves.

1. $3y - x = 10, \quad y = |x + 2|$

2. $x = -y^3 + 3y^2 - 2y, \quad y = 0, \quad x = -\sqrt{4 - 2y}$

3. $y = \dfrac{x}{\sqrt{x+6}}, \quad y = -x^3, \quad x = 1$

In Problems 4–8, find the volumes of the solids of revolution obtained by rotating the areas bounded by the curves about the given lines.

4. $y = x^2 + 4, \quad y = 2x^2 \quad$ about $y = -1$

5. $y = x^2 + 4, \quad y = 2x^2 \quad$ about $y = 8$

6. $x = 1 - y^2, \quad x = 4y^2 - 4, \quad$ about $y = 2$

7. $x = 1 - y^2, \quad x = 4y^2 - 4, \quad$ about $y = -1$

8. $y = e^{-x}, \quad y = e^{2x}, \quad y = 2 \quad$ about $y = -1$

9. Find the volume of the solid of revolution when the area inside the ellipse $x^2/a^2 + y^2/b^2 = 1$ is rotated about the x-axis.

Answers: **1.** 8 **2.** $8/3$ **3.** $1/4 - 22\sqrt{7}/3 + 8\sqrt{6}$ **4.** $448\pi/5$ **5.** $512\pi/5$
6. $80\pi/3$ **7.** $40\pi/3$ **8.** $\pi(-21/4 + 12\ln 2)$ **9.** $4\pi ab^2/3$