

USING EXTRA PAPER OF YOUR OWN AND SHOWING ALL STEPS, solve the following problems. Take the time to simplify carefully (to the extent that we have discussed in class) Give EXACT values and BOX ANSWERS. Problems 1-8 are worth 2 points each and problems 9-11 are worth 3 points each and should show all steps in the setup and solution.

1. $y = 5^{\sqrt{3x+4}}$. Find $\frac{dy}{dx}$

2. $\int_0^1 4^x \cos 2^{2x} dx =$

3. $\int_{e^2}^{e^6} \frac{(\ln x)^3}{x} dx =$

4. $\int_0^\pi \frac{1 + \sin x}{x - \cos x} dx =$

5. $\int (1 + 2^x)^2 \cdot 2^{-x} dx =$

6. $\int \frac{e^x + e^{-x}}{e^x - e^{-x}} dx =$

7. $\int_{\frac{\pi}{6}}^{\frac{2\pi}{3}} e^{\cos^2 x} \sin 2x dx =$

8. $y = \cos(\log_{10} 10x)$. Find $\frac{dy}{dx}$

9. Find the area of the region bounded by the graphs of $y = e^x$, $y = \frac{x}{x^2 + 9}$, $x = 0$, and $x = 1$

10. Find the area of the region bounded by the graphs of $y = e^{-x}$, $y = -e^{2x}$, $x = 0$, and $x = 2$

11. The region under the graph of $y = 5^{-x}$ from $x = -1$ to $x = 1$ is revolved about the x -axis. Find the volume of the resulting solid.