

Directions: Show all work on a separate sheet of paper for full credit.

1. Find the exact area of the surface obtained by rotating the curve about the x-axis.

(a) $y = \cos\left(\frac{1}{2}x\right)$ for $0 \leq x \leq \pi$

(b) $x = 1 + 2y^2$ for $1 \leq y \leq 2$

2. Find the exact area of the surface obtained by rotating $y = \frac{1}{3}x^{3/2}$, $0 \leq x \leq 12$ about the y-axis.