

1. Determine the arc-length of the following:

a) $x = \frac{1}{3}y^{3/2} - y^{1/2}$ for $1 \leq y \leq 9$

b) $y = \frac{3}{4}x^{4/3} - \frac{3}{8}x^{2/3} + 5$ for $1 \leq x \leq 8$

c) $x = \int_0^y \sqrt{\sec^4 t - 1} dt$ for $-\frac{\pi}{4} \leq y \leq \frac{\pi}{4}$

2. The following curves are rotated about the y – axis. Determine their surface area.

a) $x = 2\sqrt{4 - y}, 0 \leq y \leq \frac{15}{4}$

b) $y = \frac{1}{3}(x^2 + 2)^{3/2}$ for $0 \leq x \leq \sqrt{2}$

c) $x = \frac{e^y + e^{-y}}{2}$ for $0 \leq y \leq \ln 2$