Name: _____

Arc length and area of revolution

Find the arc lengths of the following curves:

1. $y = 1 + 6x^{3/2}, \quad 0 \le x \le 1.$

2. $y^2 = 4(x + 4)^3, \quad 0 \le x \le 2, y > 0$

3. $x = \dfrac{y^4}{8} + \dfrac{1}{4y^2}, \quad 1 \le y \le 2.$

4. $x = \dfrac{1}{3}\sqrt{y}(y - 3), \quad 1 \le y \le 9$

5. Find the arc length function for the curve $y = 2x^{3/2}$ with starting point $P_0 = (1, 2)$.

6. $y = \sqrt{x - x^2} + \sin^{-1}(\sqrt{x})$

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

7. $y = \sqrt{1 + 4x}, \quad 1 \le x \le 5.$

8. $x = 1 + 2y^2, \quad 1 \le y \le 2.$

9. $y = e^{-x}, \quad x \ge 0.$