BC CALCULUS PRACTICE 7.4 **Name:** ____________________________ **Period** _______

Aisle _________ pg. 469 – 3, 7, 11, 17, 25, 31ab

Show all necessary work neatly.

In Exercises 3–8, find the exact arc length of the curve over the stated interval.

3. $y = 3x^{3/2} - 1$ from $x = 0$ to $x = 1$

7. $24xy = y^4 + 48$ from $y = 2$ to $y = 4$

In Exercises 9–12, find the exact arc length of the parametric curve without eliminating the parameter.

11. $x = \cos 2t, \quad y = \sin 2t \quad (0 \le t \le \pi/2)$

17.

Consider the curve $y = x^{2/3}$.

(a) Sketch the portion of the curve between $x = -1$ and $x = 8$.

(b) Explain why Formula (4) cannot be used to find the arc length of the curve sketched in part (a).

(c) Find the arc length of the curve sketched in part (a).

25. Find a positive value of k (to two decimal places) such that the curve $y = k \sin x$ has an arc length of $L = 5$ units over the interval from $x = 0$ to $x = \pi$. [*Hint:* Find an integral for the arc length L in terms of k, and then use a CAS or a scientific calculator with a numeric integration capability to find integer values of k at which the values of $L - 5$ have opposite signs. Complete the solution by using the Intermediate-Value Theorem (2.5.8) to approximate the value of k to two decimal places.]

31.

(a) Show that the total arc length of the ellipse

$$x = 2\cos t, \quad y = \sin t \qquad (0 \le t \le 2\pi)$$

is given by

$$4\int_0^{\pi/2} \sqrt{1 + 3\sin^2 t}\, dt$$

(b) Use a CAS or a scientific calculator with numerical integration capabilities to approximate the arc length in part (a). Round your answer to two decimal places.