MATE 3032 assignment 6: sections 8.1, 8.2, 10.3

40. Find the length of the curve $y = 2 + x\sqrt{x},\ 0 \le x \le 1$.

41.

(a) Derive the formula $\int \csc x\, dx = -\ln|\cot x + \csc x| + C$.

(b) Find the length of the arc of curve $y = \ln(\sin t),\ \pi/4 \le t \le \pi/3$.

42. (See previous exercise).

(a) Find the arc length function for the curve $y = \ln(\sin t),\ 0 < t < \pi$, with starting point $(\pi/2, 0)$.

(b) Show the curve and its arc length function on the same graph. For this, you may visit the wolframalpha site.

43. Exercise 38 p.549, where you use the equation $s(x) = \int_0^x \sqrt{2t+3}\, dt$.

44. Exercise 40 p.549.

45. Find the area of the surface obtained by rotating the curve around the x-axis:

(a) $y^2 = x + 1,\ 0 \le x \le 2$

(b) $x = 1 - y^2,\ 0 \le y \le 2$.

46–48. Exercises 27, 31, 33 p.556. For ex 27, use the principle of comparison.

49. Find a formula for the distance between points of polar coördinates (r_1, θ_1) and (r_2, θ_2).

50. Find a polar equation for the curve given in cartesian form by $x^2 + y^2 = 2cx$.

51. Exercise 68 p.668. Wolframalpha is your friend.