

Name: SOLUTIONS

Quiz #8 - March 2, 2007

1.

$$\int_1^3 \frac{x}{x^2 + 4x + 29} dx.$$

$$x^2 + 4x + 29 = (x+2)^2 + 25 \quad u = x+2 \quad x = u-2 \\ du = dx$$

$$\int_3^5 \frac{u-2}{u^2+25} du = \int_3^5 \frac{u}{u^2+25} - \frac{2}{u^2+25} du$$

$$= \left(\frac{1}{2} \ln |u^2+25| - \frac{2}{5} \tan^{-1} \left(\frac{u}{5} \right) \right) \Big|_3^5$$

$$= \left(\frac{1}{2} \ln 50 - \frac{2}{5} \tan^{-1}(1) \right) - \left(\frac{1}{2} \ln 34 - \frac{2}{5} \tan^{-1} \left(\frac{3}{5} \right) \right)$$

$$= \frac{1}{2} \ln 50 - \frac{2}{5} - \frac{\pi}{4} - \frac{1}{2} \ln 34 + \frac{2}{5} \tan^{-1} \left(\frac{3}{5} \right)$$

2. Write down but do not evaluate an integral which gives the arclength of the graph of $y = x^2 + 2x + 3$ between the points (1, 6) and (9, 18).

$$y' = 2x + 2$$

$$A.L. = \int_1^9 \sqrt{1 + (2x+2)^2} dx$$