

Last Name: SOLUTIONS

First Name: \_\_\_\_\_

Student ID: \_\_\_\_\_

## Quiz 3 (B)

Question 1. Evaluate the following definite integrals:

(a) (5 marks)

$$\int_1^4 \frac{3+te^t+\sqrt{t}}{t} dt = \int_1^4 \left[ \frac{3}{t} + e^t + t^{-1/2} \right] dt$$

$$= \left[ 3 \ln|t| + e^t + 2t^{1/2} \right]_1^4$$

$$= \left( 3 \ln 4 + e^4 + 2(4)^{1/2} \right) - \left( 3 \ln(1) + e^1 + 2(1)^{1/2} \right)$$

$$= 3 \ln 4 + e^4 - e + 2$$

(b) (5 marks)

$$\int_{\pi/4}^{\pi/3} (\sec^2 x + \sin x) dx = \left[ \tan x - \cos x \right]_{\pi/4}^{\pi/3}$$

$$= \left( \tan \frac{\pi}{3} - \cos \frac{\pi}{3} \right) - \left( \tan \frac{\pi}{4} - \cos \frac{\pi}{4} \right)$$

$$= \frac{\frac{\sqrt{3}}{2} - \frac{1}{2}}{\frac{1}{2}} - 1 + \frac{\sqrt{2}}{2} = \sqrt{3} - \frac{3}{2} + \frac{\sqrt{2}}{2}$$