

Last Name: SOLUTIONS

First Name: _____

Student ID: _____

Quiz 2 (A)

Question 1. (4 marks) Find the following:

$$\int \frac{x+2}{\sqrt{x+1}} dx = \int \frac{(u-1)+2}{\sqrt{u}} du$$

$$\text{Let } u = x+1 \Rightarrow u-1 = x \\ du = dx$$

$$= \int \frac{u+1}{u^{1/2}} du = \int (u^{1/2} + u^{-1/2}) du = \frac{u^{3/2}}{3/2} + \frac{u^{1/2}}{1/2} + C$$

$$= \frac{2}{3} (x+1)^{3/2} + 2 (x+1)^{1/2} + C$$

Question 2. Find the value of the sum:

$$(a) \text{ (3 marks) } \sum_{i=1}^n (i^2 + 3i + 4) = \sum_{i=1}^n i^2 + 3 \sum_{i=1}^n i + 4 \sum_{i=1}^n 1$$

$$= \frac{n(n+1)(2n+1)}{6} + 3 \frac{n(n+1)}{2} + 4n$$

$$(b) \text{ (3 marks) } \sum_{j=-2}^4 2^{3-j} \quad (\text{write your answer as a fraction})$$

$$= 2^5 + 2^4 + 2^3 + 2^2 + 2^1 + 2^0 + 2^{-1}$$

$$= 32 + 16 + 8 + 4 + 2 + 1 + \frac{1}{2}$$

$$= 63 + \frac{1}{2} = \frac{126}{2} + \frac{1}{2} = \frac{127}{2}$$