### Math 102, Section: 18, 20, 23 (052)

**Quiz-1(a)**

**Time**: 15 Minutes  
**Marks**: ……./9

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(i) For $f(x) = \sqrt{1 - x^2}$, use rectangle method to approximate area $A_n$ over $[0,1]$ when $n = 4$.

(ii) Evaluate: $\int \sqrt{\sin \theta \cos \theta} \, d\theta$.

(i) 

(ii)
(i) Find area $A(x)$ between the graph of $f(x) = 4x - 4$ and $[1, x]$ by a formula from geometry.

(ii) Use derivative of $f(t) = \frac{t^2}{2}$ to state the corresponding integral formula.
(i) Solve the initial-value problem:
\[ \frac{d^2y}{dx^2} = 2\cos x - 5\sin x \]
where \( y'(\pi) = 3 \) and \( y(\pi) = 2 + 6\pi \).
(i) Approximate area $A_n$ of the curve $f(x) = 4 - 2x$ over $[0, 2]$ for $n = 2$.

(ii) Evaluate: $\int \tan^3 5x \sec^2 5x \, dx$. 

(i)

(ii)