

KFUPM - Math Dept. - MATH 102  
Quiz 1 - Term 152. Inst.: Shadi Al-Omari

Name: \_\_\_\_\_ ID: \_\_\_\_\_ S.N.: \_\_\_\_\_

---

**Question1 :**( 2.5 pts) Determine a region whose area is equal to the given limit. Do not evaluate the limit.

$$\lim_{n \rightarrow \infty} \sum_{i=1}^n \frac{2}{n} \left( 5 + \frac{2i}{n} \right)^{10}$$

---

**Question2 :**( 2.5 pts) Set up an expression for  $\int_1^3 e^x dx$  as a limit of sums.

**Question3:** (2.5 pts) If  $f(x) = \int_0^{\sin x} \sqrt{1+t^2} dt$ . and  $g(y) = \int_3^y f(x) dx$ , find  $g''(\frac{\pi}{6})$ .

---

**Question4:** (2.5 pts) Evaluate the limit by first recognizing the sum as a Riemann sum for a function defined on  $[0,1]$ .

$$\lim_{n \rightarrow \infty} \frac{1}{n} \left( \sqrt{\frac{1}{n}} + \sqrt{\frac{2}{n}} + \sqrt{\frac{3}{n}} + \cdots + \sqrt{\frac{n}{n}} \right)$$