

Name: _____

Date: _____

1. Use a right Reimann sum with 4 sub-intervals to approximate the area under the curve $y = x^2 + 1$ on the interval $[0, 2]$. Is your approximation overestimating or underestimating the true area? (4 marks)

2. Evaluate $\int x^2 + 2x + 5 dx$ (3 marks)

3. Evaluate $\int \frac{(1+x)^2}{x^2} dx$. (3 marks)

4. Evaluate $\int 3x\sqrt{1-2x^2} dx$ (3 marks)

5. Evaluate $\int_0^{\frac{\pi}{4}} x + 2\sec^2 x \, dx$ (4 marks)

6. Evaluate $\int_{-3}^5 |x + 1| \, dx$ (4 marks)

7. Evaluate $\frac{d}{dx} \int_2^x \sqrt{\tan t} dt$

(2 marks)

8. A particle moves along the x axis with an acceleration given by $a(t) = t - 1$. If the initial velocity was 0 at time $t=0$, what is the displacement and total distance travelled on the interval $0 \leq t \leq 4$.

(4 marks)

9. Find the average value of the function $y = \frac{1}{x}$ on the interval $[1, 4]$. (3 marks)