

Name: _____

Use of books, notes or calculators is **NOT** permitted.

Please show all your work! Answers without appropriate supporting work may not receive full credit.

Clearly indicate your answers to each problem by underlining them or placing a box around your answers!

Trigonometric functions at the values $0, \pi/6, \pi/4, \pi/3, \pi/2$, etc must be evaluated!

T/F Questions are graded with NO PARTIAL CREDIT.

Exam Score

Problem	Score	Out of:
1		10
2		20
3		20
4		10
5		15
6		15
7		10
Total		100

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1. [10] For the True/False questions below, clearly circle your answer.

T or F If $p(x)$ is a polynomial function, then p has exactly one antiderivative whose graph contains the origin.

T or F The sum of the first n positive integers is $\frac{n(n+1)}{2}$.

T or F If $\int_a^b f(x) dx > 0$ then f is non-negative for all x in the interval $[a, b]$.

T or F $\int_{-10}^{10} (ax^3 + bx^2 + cx + d) dx = 2 \int_0^{10} (bx^2 + d) dx$.

T or F $\int_{-1}^2 \frac{1}{x} dx = \ln|x| \Big|_{x=-1}^{x=2} = \ln 2 - \ln 1 = \ln 2$.

2. [20] Let A be the area of the region that lies under the graph of $f(x) = x^2$, x -axis and between $x = 0$ and $x = 3$. Evaluate A , by forming the Riemann sum taking sample points to be the right endpoints and then making $n \rightarrow \infty$.

3. [20] Evaluate the integrals

(a) $\int x^2 \sqrt{x^3 + 1} dx$

(b) $\int_0^1 \frac{t}{t^4+1} dt$

(c) $\int \arctan t dt$

(d) $\int_0^1 x^2 e^x dx$

4. [10] If

$$F(x) = \int_2^{x^2} \frac{1}{t^3} dt$$

find $F'(x)$.

5. [15] Find the function $f(\theta)$, if $f''(\theta) = \sin \theta + \cos \theta$, $f(0) = 3$ and $f'(0) = 4$.

6. [15] Find the interval on which the curve

$$y = \int_0^x \frac{1}{1+t+t^2} dt$$

is concave upward.

7. [10] Evaluate the integral

$$\int \cos^3(x) \sin^2(x) dx$$