MATH 132 **FINAL EXAM** **F12M132.4.1**

This exam should have 20 multiple choice questions, 5 points each. If you don't have a PENCIL to mark your card, please ask to borrow one from your proctor. Write your ID NUMBER (not your SS number) in the six boxes on the side of your answer card, and then shade in the corresponding numbers. The needed data for trigonometric functions and power series is contained on the last page.

1) Use substitution to evaluate $\int_0^{\pi/4} \tan^3(x) \cdot sec^2(x)\,dx$

$A)$ 0
$B)$ 0.15
$C)$ 0.25
$D)$ 0.35
$E)$ 0.45
$F)$ 0.55
$G)$ 0.65
$H)$ 0.75
I) 0.85
$J)$ 1

2) Use integration by parts to evaluate $\int_1^e x^2 ln(x)\,dx$.

$A)$ 4.08

$B)$ 4.16

$C)$ 4.28

$D)$ 4.34

$E)$ 4.42

$F)$ 4.57

$G)$ 4.69

$H)$ 4.74

$I)$ 4.82

$J)$ 4.93

3) Using partial fractions, find a solution to $\int \frac{-1}{x^2-x}\,dx.\quad (x>1)$

A) $arctan(2x-1)$
B) $(x^2-x)^{-2}$
C) $ln(x^2-x)$
D) $ln(x)+ln(x-1)$
E) $ln(\frac{x}{x-1})$
F) $\frac{ln(x)}{ln(x-1)}$
G) $ln(\frac{x}{x-1})+x$
$H)$ $ln(\frac{x}{x-1})-\frac{1}{x}$
$I)$ $\frac{ln(x-1)}{x^2}$
$J)$ $\frac{x^2}{ln(x-1)}$

4) Find what becomes of the integral $\int \frac{x^2}{\sqrt{9-x^2}}\,dx$, when you make the substitution $x=\ 3\,sin(\theta),\ \ -\frac{\pi}{2}\ <\theta<\frac{\pi}{2}.$

A) $3\int sin(\theta)\,d\theta$
B)$3\ \int cos(\theta)\,d\theta$
C) $\int \frac{9}{sin(\theta)}\,d\theta$
D) $\int \frac{9}{cos(\theta)}\,d\theta$
E) $3\int sec^2(\theta)\,d\theta$
F) $3\int csc^2(\theta)\,d\theta$
G) $9\int sin^2(\theta)\,d\theta$
H) $9\int cos^2(\theta)\,d\theta$
I) $\int\sqrt{9-sin^2(\theta)}\ d\theta$
J) $\int\sqrt{9-cos^2(\theta)}\ d\theta$

5) Find the **area** of the region enclosed by the curve $y = 2 - x^2$ and the line $y = 2 - 2x$.

$A)$ 1
$B)$ $\frac{1}{2}$
$C)$ $\frac{3}{2}$
$D)$ $\frac{4}{3}$
$E)$ $\frac{7}{5}$
$F)$ $\frac{5}{3}$
$G)$ $\frac{11}{5}$
$H)$ $\frac{9}{2}$
$I)$ $\frac{14}{3}$
$J)$ $\frac{13}{5}$

6) Find the **volume** of the solid obtained by **rotating** the region enclosed by the curve $x = \frac{2}{y}$, the lines $y = 1$, $y = 4$, and the y-axis, about the **y-axis**.

$A)$ $\frac{\pi}{4}$
$B)$ $\frac{3\pi}{4}$
$C)$ π
$D)$ $\frac{5\pi}{4}$
$E)$ $\frac{7\pi}{4}$
$F)$ $\frac{9\pi}{2}$
$G)$ 2π
$H)$ $\frac{9\pi}{4}$
$I)$ 3π
$J)$ $\frac{4\pi}{3}$