

MATH 221 EXAM 2

Thursday July 3, 2014

Instructor's Name: _____

Name: _____

No books are allowed. Use the back page as a sketch paper. For full credit show your work in detail.

Total:40	# 1	# 2	# 3	# 4	# 5

1 (8 pts). Indicate whether the integral converges or does not converge.

• a. $\int_1^{\infty} x e^{-x} dx$

• b. $\int_1^{\infty} \frac{dx}{\sqrt{x^4 + 1}}$

2 (8 pts). Calculate the fluid force on a semicircular (bottom half-circle) plate with a radius of 2 meters, submersed 1 meter below the surface in a fluid with density δ .

3 (8 pts). Evaluate the following integrals

- $\int \frac{2x - 1}{x^2 - 5x + 6} dx$

- $\int \frac{10dx}{(x - 1)(x^2 + 9)}$

4 (10 pts).

- a. Find the arc length of the curve $y = \frac{2}{3}x^{3/2} - \frac{1}{2}x^{1/2}$ on the interval $1 \leq x \leq 2$

- b. Find the surface area of the surface obtained by rotating the curve $y = x^3$ on the interval $0 \leq x \leq 2$ around the x -axis.

5 (6 pts). Find the centroid of the region lying between the graphs of the functions $f(x) = x^{-1}$ and $g(x) = 2 - x$ on the interval $1 \leq x \leq 2$