MATH 119 **TEST 4A Key** ***(Chapter 5, 7.1, 7.3, 6.3)*** **NAME:**

Class ID #:

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1) Values of a function *W(t)* are given in the following table.

t	2	2.5	3	3.5	4
$W(t)$	30	27	24	18	12

a) estimate $\int_2^4 W(t)dt$ from left and from right then average them

From Left: 49.5
From Right: 40.5
Average : 45

b) For your estimate in part (a), what is *n*? what is Δt?

$\Delta = 0.5$ ***and n = 4***

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2) Estimate the value of the definite integral $\int_1^4 (\frac{4}{x})dx$ by using *n* = 6 and computing:

a) The left hand sum

= 6.37

b) The right hand sum

= 4.87

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3) The marginal cost for a company is given by $C'(q) = 6q^2 - 24q + 200$ dollars/unit where q is the quantity produced. If $C(0) = 200$, find the total cost of producing 10 units

3000

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4) Find an antiderivative $F(x)$ with $F'(x) = 6x^2 - 4$ and $F(0) = 2$.

$F(x) = 2x^3 - 4x + 2$

5) Evaluate the indefinite integrals of:

a) $\int (3x^2 - \frac{2}{x^2} - 4x + 1)dx$

$= x^3 + \frac{2}{x} - 2x^2 + x + c$

b) $\int (8x^2 + 6e^{2x})dx$

$= \frac{8}{3}x^3 + 3e^{2x} + c$

c) $\int (12e^{6x} - 6\sqrt{x})dx$

$= 2e^{6x} - 4x^{3/2} + c$

d) $\int (1 + \frac{2}{x} - \frac{6}{\sqrt[3]{x^2}})dx$

$= x + 2\ln x - 18x^{1/3} + c$

6) Evaluate the definite integrals of:

a) $\int_1^e \frac{4}{x} dx = 4$

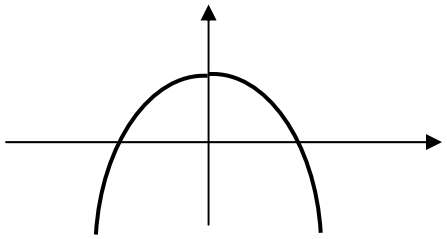
b) $\int_{-1}^1 (x^2 - x^4)\, dx = \frac{4}{15}$

c) $\int_0^1 (\sqrt{x} - x^2)dx = 1/3$

d) $\int_{-1}^2 (-x^2 + x + 2)\, dx = 4.5$

7) Find the area between $y = 4 - x^2$ and the x-axis and sketch the region bounded by the graphs

Area = 10.67



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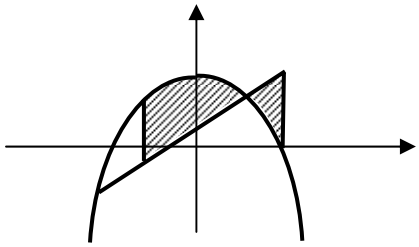
8) Find the area between $y = 9 - x^2$ and $y = 2x + 1$ in [-1 , 3] and sketch the region bounded by the graphs

Area = 21.33



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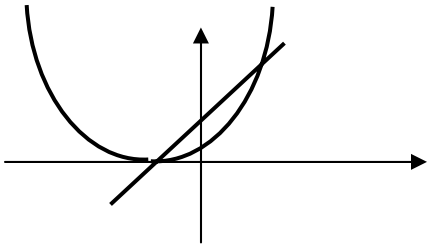
9) Find the area between $y = x^2 + 2x + 1$ and $y = 3x + 3$ and sketch the region bounded by the graphs

Area = 4.5



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10) An object starts out from the origin and its velocity is given by: $v(t) = 2t^3 + 4t$. How far does it travel the first 3 hours?

= 58.5

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11) What should *A (annuity)* per year be so that the amount of a continuous money flow over 20 years at interest rate 8%, compounded continuously, will be $ 30,000?

= $ 607.13

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12) A family makes an investment of $5000 per year at an interest rate of 8% compounded continuously. Find the amount in 20 years.

= $ 247,064.53