TEST_4B Key *(Chapter 5, 7.1, 7.3, 6.3)*   **NAME:**

                                                                    Class ID #:

1) Values of a function $W(t)$ are given in the table to the right.

t	1	1.4	1.8	2.2	2.6	3
$W(t)$	25	28	35	45	50	60

   Left sum: *73.2*

   Right sum: *87.5*   *Average: 80.2*

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

                         $\Delta = 0.4$ *and n = 5*

2) Estimate the value of the definite integral $\int_1^3 (\frac{6}{x})dx$ by using $n = 4$ and computing:

x					
$f(x) = \frac{6}{x}$					

   a) The left hand sum   *= 7.7*

   b) The right hand sum   *= 5.7*

3) The marginal cost for a company is given by $C'(q) = 3q^2 - 48q + 100$ dollars/unit where q is the quantity   **[4p]**
   produced. If $C(0) = 500$, find the total cost of producing 10 units.

                              100

4) Suppose that the velocity of an object is given by $v(t) = -t^2 + 8t + 10$, where t is in seconds. Estimate the distance
   traveled by the object during the first 5 seconds (that is, between $t = 0$ and $t = 5$) using $n = 5$

   a) the left sum: *100*

   b) The right sum   *115*

5) Find an antiderivative $F(x)$ with $F'(x) = e^{2x}$ and $F(0) = 4$.

                      $F(x) = \frac{1}{2}.e^{2x} + \frac{7}{2}$

6) Evaluate the indefinite integrals of:

a) $\int (x^3 + \frac{2}{x^3} - 8)dx = \frac{x^4}{4} - \frac{1}{x^2} - 8x + c$

b) $\int (\sqrt[3]{x} + 2)dx = \frac{3}{4}x^{4/3} + 2x + c$

c) $\int (x^2 - \frac{3}{2}\sqrt{x} + \frac{1}{\sqrt[3]{x^4}})dx$

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

d) $\int (2 - \frac{4}{x} - \frac{1}{x^4})dx$

$= 2x - 4\ln x + \frac{1}{3x^3} + c$

7) Evaluate the definite integrals of:
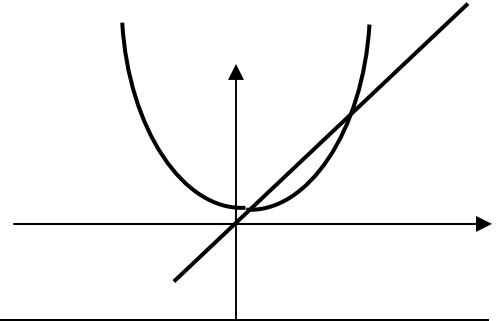
a) $\int_1^e \frac{6}{x}dx = \mathbf{6}$

b) $\int_1^2 (6x^3 + 2)dx = \mathbf{24.5}$

c) $\int_{-2}^1 (2 - x - x^2)dx = \mathbf{4.5}$

d) $\int_1^e (x - \frac{1}{x}dx = \mathbf{2.19}$
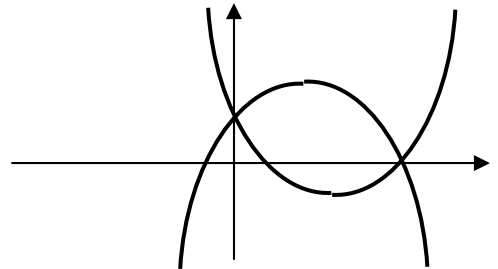
8) Find the area between $y = 4x$ and $y = x^2 + 3$ and sketch the region bounded by the graphs
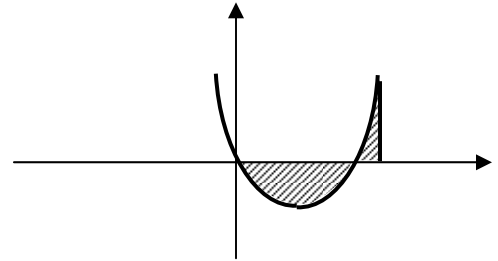
Area = 4/3

9) Find the area between $y = x^2 - 4x + 3$ and $y = -x^2 + 2x + 3$ and sketch the region bounded by the graphs

Area = 9

10) Find the area between $y = x^2 - 2x$ and the x-axis in [0 , 3] and sketch the region bounded by the graphs

Area = 2.67

11) The marginal revenue for the price of tickets is given by $R' = 10q - 50$ dollars per ticket, where q is the number of tickets. Find the total revenue from the sale of tickets for the first 20 tickets.

$1000

12) What should *A (annuity)* per year be so that the amount of a continuous money flow over 10 years at interest rate 5%, compounded continuously, will be $ 20,000?

$1541.49

13) Find the present value of an investment over 15 years period if there is a continuous money flow of $1000 per year and the current interest rate is 8% compounded continuously

$8735.07