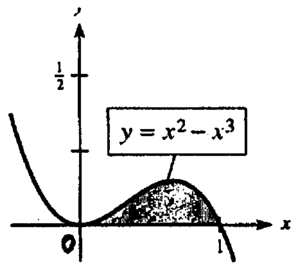
MAT 112 (2. Habersiz Sınav) **Grup ML1 (10:30-12:20)** **13/3/2014**

1-



Şekilde belirtilen bölgenin alanını bulunuz.

2- $\int_0^\infty 3e^{-3x}\,dx$ has olmayan integralinin değerini bulunuz.

SÜRE: 15dk. (20 puan)

Çözüm

1) $A = \int_0^1 (x^2 - x^3)\,dx = \left(\frac{x^3}{3} - \frac{x^4}{4}\right]_0^1 = \frac{1}{3} - \frac{1}{4} - 0 = \boxed{\frac{1}{12}}$ br^2.

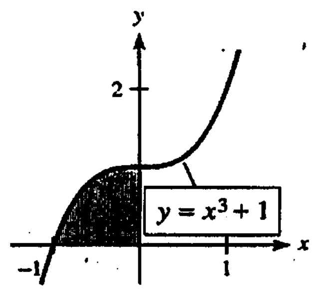
2) $\int_0^\infty 3\,e^{-3x}dx = \lim_{r\to\infty} \int_0^r 3e^{-3x}dx = \lim_{r\to\infty}\left(3.\frac{e^{-3x}}{-3}\right]_0^r$

$= \lim_{r\to\infty}\left(-e^{-3x}\right]_0^r$

$= \lim_{r\to\infty}\left(-\cancel{\frac{1}{e^{3r}}}^{\,0} + \frac{1}{e^0}\right) = \boxed{1}$

MAT 112 (2. Habersiz Sınav) **Grup ML2 (13:30-15:20)** **13/3/2014**

1-



Şekilde belirtilen bölgenin alanını bulunuz.

2- $\int_{-\infty}^{0} 3e^{3x}\,dx$ has olmayan integralinin değerini bulunuz.

SÜRE: 15dk. (20 puan)

Çözüm:

1- $A = \int_{-1}^{0} (x^3+1)\,dx = \left(\frac{x^4}{4}+x\right]_{-1}^{0} = 0 - \left(\frac{1}{4}-1\right) = -\frac{1}{4}+1 = \boxed{\frac{3}{4}\ \text{br}^2}$

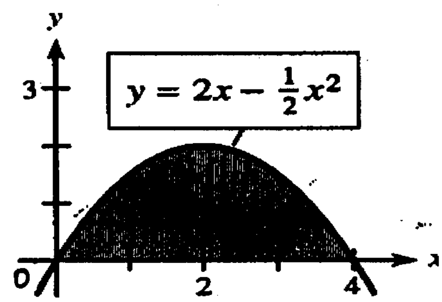
2- $\int_{-\infty}^{0} 3e^{3x}\,dx = \lim_{r\to-\infty} \int_{r}^{0} 3e^{3x}\,dx$

$= \lim_{r\to-\infty} \left(\cancel{3}\cdot\frac{e^{3x}}{\cancel{3}}\right]_{r}^{0}$

$= \lim_{r\to-\infty} \left(e^{0} - \overset{\to 0}{\cancel{e^{3r}}}\right) = 1 - 0 = \boxed{1}$

MAT 112 (2. Habersiz Sınav) **Grup ML3 (17:30-19:20)** **13/3/2014**

1-



Şekilde belirtilen bölgenin alanını bulunuz.

2- $\int_1^{\infty} \frac{1}{x^{4/3}} dx$ has olmayan integralinin değerini bulunuz.

SÜRE: 15dk. (20 puan)

Çözüm:

1- $A = \int_0^4 \left(2x - \frac{1}{2}x^2\right) dx = \left(\cancel{2}\frac{x^2}{\cancel{2}} - \frac{1}{2}\frac{x^3}{3}\right)\Big|_0^4$

$= \left(x^2 - \frac{x^3}{6}\right)\Big|_0^4 = 16 - \frac{64}{6} - 0$

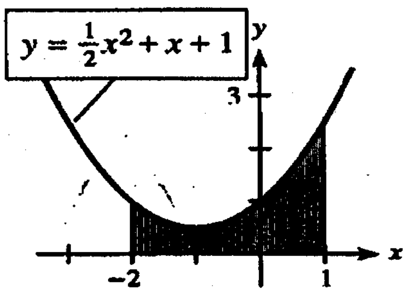
$= 16 - \frac{32}{3} = \frac{48-32}{3} = \boxed{\frac{16}{3}\ br^2}$

2- $\int_1^{\infty} \frac{1}{x^{4/3}} dx = \lim_{r \to \infty} \int_1^r x^{-4/3} dx = \lim_{r \to \infty} \left(\frac{x^{-1/3}}{-\frac{1}{3}}\right]_1^r$

$= \lim_{r \to \infty} \left(-3 \frac{1}{x^{1/3}}\right|_1^r = \lim_{r \to \infty} \left(\cancel{\frac{-3}{r^{1/3}}}^{\,0} + \frac{3}{1}\right) = \boxed{3}$

MAT 112 (2. Habersiz Sınav) **Grup ML4 (17:30-19:20)** **14/3/2014**

1-



Şekilde belirtilen bölgenin alanını bulunuz.

2- $\int_1^{\infty} \frac{1}{x^4}\,dx$ has olmayan integralinin değerini bulunuz.

SÜRE: 15dk. (20 puan)

Çözüm!

1) $A = \int_{-2}^{1} \left(\frac{1}{2}x^2 + x + 1\right) dx = \left(\frac{x^3}{6} + \frac{x^2}{2} + x\right]_{-2}^{1}$

$= \frac{1}{6} + \frac{1}{2} + 1 - \left(\frac{(-2)^3}{6} + \frac{(-2)^2}{2} + (-2)\right)$

$= \frac{1}{6} + \frac{1}{2} + 1 + \frac{8}{6} - \frac{4}{2} + 2$

$= \frac{9}{6} + \frac{3}{2} - \cancel{2} + \cancel{2} = \frac{3}{2} + \frac{3}{2} = \frac{6}{4} = \boxed{\frac{3}{2}\ br^2}$

2) $\int_1^{\infty} \frac{1}{x^4}\,dx = \lim_{r\to\infty} \int_1^r x^{-4}\,dx = \lim_{r\to\infty} \left(\frac{x^{-3}}{-3}\right]_1^r$

$= \lim_{r\to\infty} \left(-\frac{1}{3} \cdot \frac{1}{x^3}\right|_1^r = \lim_{r\to\infty} \left(\cancel{-\frac{1}{3}\frac{1}{r^3}}^{\,0} + \frac{1}{3} \cdot \frac{1}{1}\right)$

$= \boxed{\frac{1}{3}}$