

CALCULO II

7.03

EXAME FINAL

Lista de Nomes

72

Adriano A. Sampaio 6.7

Andréa Churata A.O. Voz 7.0

82

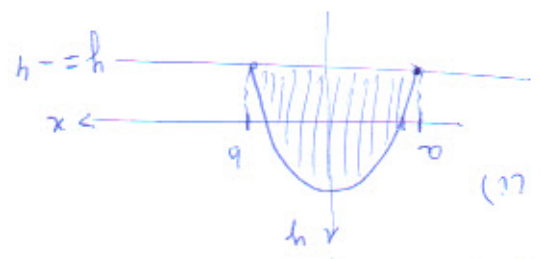
Paulo Victor Gomes de Souza 5.7

Michael Rodas Filho 5.8

Murilo de Jesus Santos Silva (sem valor na média) 7.0
Rafael Carvalho de Aguiar 4.6

Nome do Aluno	Matricula
ADRIANNO DE ABBADIA SAMPAIO	201310049911
ANDRESSA CHRISTINA ALMEIDA DE OLIVEIRA VAZ	201310406411
ANGELO MARCIO VALE DA COSTA	201020514511
BEATRIZ CARVALHO DE AGUIAR	201310047611
BRUEN TURAZZI ALMEIDA	201210373911
CLAUDIUS IBN CARDOZO DA SILVA	201210048011
ELIZABETH DE SOUZA MADUREIRA MOTHE	201120599311
FLAVIO DE PAULA CRUZ	200420520311
GABRIEL DOS SANTOS ALBUQUERQUE BARROSO	201210050111
GABRIEL RODRIGUES MORAES	201210049811
GERMAN DE LACERDA FIORILLO LANDIVAR	201110307911
GLEICY SOTERO ROBERTO	200910191711
INACIO MANCO DE BRITO JUNIOR	200310293111
INGRITI RANGEL DA SILVA	200920487811
JOÃO RICARDO DA SILVA TEIXEIRA FILHO	201120403311
JORGE FERREIRA LEAL JUNIOR	200420514111
JOSEPH TORRES KALTENECKER	201310407111
LEONARDO SANTOS MEIRELLES	201210320711
LUANA PONTES GOUVEIA	201310433711
LUCIANO DOS SANTOS	200310153011
MARCOS VINICIO MEDEIROS PANZEMBCK	201120529411
MATHEUS COSTA STUTZEL	201310406611
MICHEL PEDRO FILIPPO	201310406511
MUNIQUE VALERIO DOS SANTOS	200510261711
MURILO DE JESUS SANTOS SILVA	201220605411
NILIO SILVA CANCIO PEREIRA SOARES	201110042611
PAULO VICTOR GOMES DE SOUSA	201310047911
RAFAELA CORREIA BRUM	201310047411
RENAN BIDES DE ANDRADE	201310047011
RENATO DOMINGUES CARNEIRO JUNIOR	201310048911
STEPHANE RODRIGUES DE MENEZES	201310242511
SUELEN REGINA CORDEIRO DOS SANTOS	201310047511
THAINA LOPES FIGUEIREDO	201310047111
VANESSA CASSIA ALMEIDA DA SILVA	201110243611
VICTOR D'ALESSANDRO ARUJAR REIS	201210048911

1) 1.0 cada



$$a = 2, b = -2$$

$$x^2 = -(-4)$$

$$\therefore x = \pm 2$$

Área: $\int_b^a [(-x^2) - (-4)] dx = \int_{-2}^2 (-x^2 + 4) dx = \left(-\frac{x^3}{3} + 4x \right) \Big|_{-2}^2$

= $\frac{32}{3}$ unidades de área.

(a) $\int_3^0 \sqrt{1 + [y'(x)]^2} dx$

$$y'(x) = 2$$

$$y^2(x) = \frac{5}{4} x^2 \Rightarrow 2y \cdot y'(x) = \frac{5}{4} \cdot 2x$$

$$\frac{5}{2} x^{3/2} \cdot y'(x) = \frac{5}{4} \cdot x$$

$$\therefore \frac{dy}{dx} = x^{1/2}$$

Comprimento de arco: $\int_3^0 \sqrt{1+x} dx = \frac{2}{3} (1+x)^{3/2} \Big|_3^0 = \frac{3}{14}$ unidades.

2) 1.0 cada

(c) $q_2 - q_1 = 10x \cdot \frac{x^2+y^2}{x^2+y^2} - 10y \cdot \frac{x^2+y^2}{x^2+y^2} \neq 0$

Não conservativo

$$(ii) \text{ Se } f(x) = (u(x), v(x)), \text{ onde: } f'(x) = (u'(x), v'(x)).$$

Considerando:

$$u(x) = \int_{-1}^x \sqrt{t^4 + 1} \, dt = - \int_x^{-1} \sqrt{t^4 + 1} \, dt \quad \text{e} \quad v(x) = \int_x^0 dt, \text{ temos:}$$

$$f'(x) = \left(-\sqrt{x^4 + 1}, 1 \right).$$

$$3) \quad u = f(x) + g(x), \text{ onde:}$$

$$f(x) = \cos[\cos(x^2 - \cos x)] \quad \text{e} \quad g(x) = \frac{1}{(y^2 - 4)^{-2}}$$

$$\frac{\partial u}{\partial x} = ? \quad \frac{\partial u}{\partial y} = ?$$

$$u_x = -\sin[\cos(x^2 - \cos x)] \cdot [-\sin(x^2 - \cos x)] \cdot [2x^2 + \cos x] \\ u_y = -\frac{1}{(y^2 - 4)^2} \cdot \frac{1}{(y^2 - 4)^{-2}} \cdot (-2y)$$

$$\text{Se } x = u/v, \quad y = v/u;$$

$$\frac{\partial u}{\partial x} = ? \quad \frac{\partial u}{\partial y} = ?$$

$$u_x = \frac{\partial u}{\partial x} \cdot \frac{\partial x}{\partial s} + \frac{\partial u}{\partial y} \cdot \frac{\partial y}{\partial s}, \quad u_y = \frac{\partial u}{\partial x} \cdot \frac{\partial x}{\partial t} + \frac{\partial u}{\partial y} \cdot \frac{\partial y}{\partial t}$$

$$\text{onde } x_s = -v/v^2, \quad x_t = 1/v, \quad y_s = 1/v, \quad y_t = -v/v^2.$$

4) 3.0 cada

$$(ii) \nabla f(x, y) = (-12x, -2y) \Rightarrow \nabla f(1, -4) = (-12, 8).$$

\therefore Níveis de valor $-12x + 8y$.

(iii) Níveis de valor $-\nabla f(1, -4) = (12, -8)$ ou $12x - 8y$.

$$\int_x^{x^2} \sqrt{\frac{x}{y}} dy = \frac{1}{\sqrt{x}} \int_x^{x^2} y^{1/2} dy = \frac{1}{\sqrt{x}} \cdot \frac{2}{3} y^{3/2} \Big|_x^{x^2} = \frac{2}{3} \frac{\sqrt{x}}{x} (x^3 - x) = \frac{2}{3} (x^{5/2} - x^{1/2})$$

$$\int_4^1 \left(\sqrt{\frac{x}{y}} \right) dy dx = \frac{2}{3} \int_4^1 (x^{5/2} - x^{1/2}) dx = \frac{2}{3} \left(\frac{2}{7} x^{7/2} - \frac{2}{3} x^{3/2} \right) \Big|_4^1 = \frac{2}{3} \left(\frac{2}{7} - \frac{2}{3} \right) = \frac{2}{3} \left(-\frac{4}{21} \right) = -\frac{8}{63}$$

— x —