RepresentaÃ§Ã£o em Tabela de uma FunÃ§Ã£o de Duas Vari

$S(H,T)$

Umidade relativa (%)

Temperatura real (°C) T \ H	40	45	50	55	60	65	70	75	80
26	28	28	29	31	31	32	33	34	35
28	31	32	33	34	35	36	37	38	39
30	34	35	36	37	38	40	41	42	43
32	37	38	39	41	42	43	45	46	47
34	41	42	43	45	47	48	49	51	52
36	43	45	47	48	50	51	53	54	56

$S(?,?,25) = ?$

$S(65,26) = 32$

$S(70,34) = 48$

$S_{térmica} = S_{térmica}(H,T)$

$f(x,y) = x^2y$ ← Expressão analítica

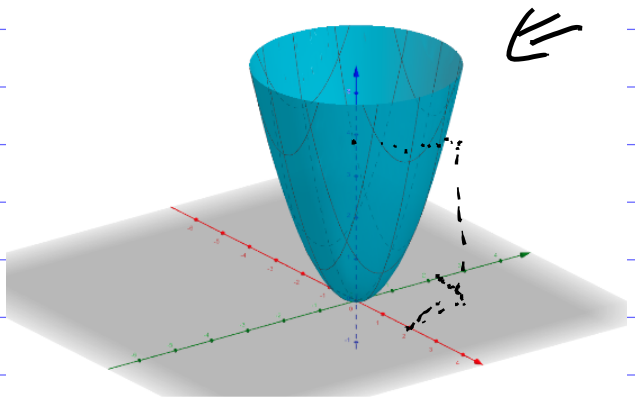
TABELA 1 Índice de sensação térmica como função da temperatura do ar e velocidade do vento

$F(T, v, g)$

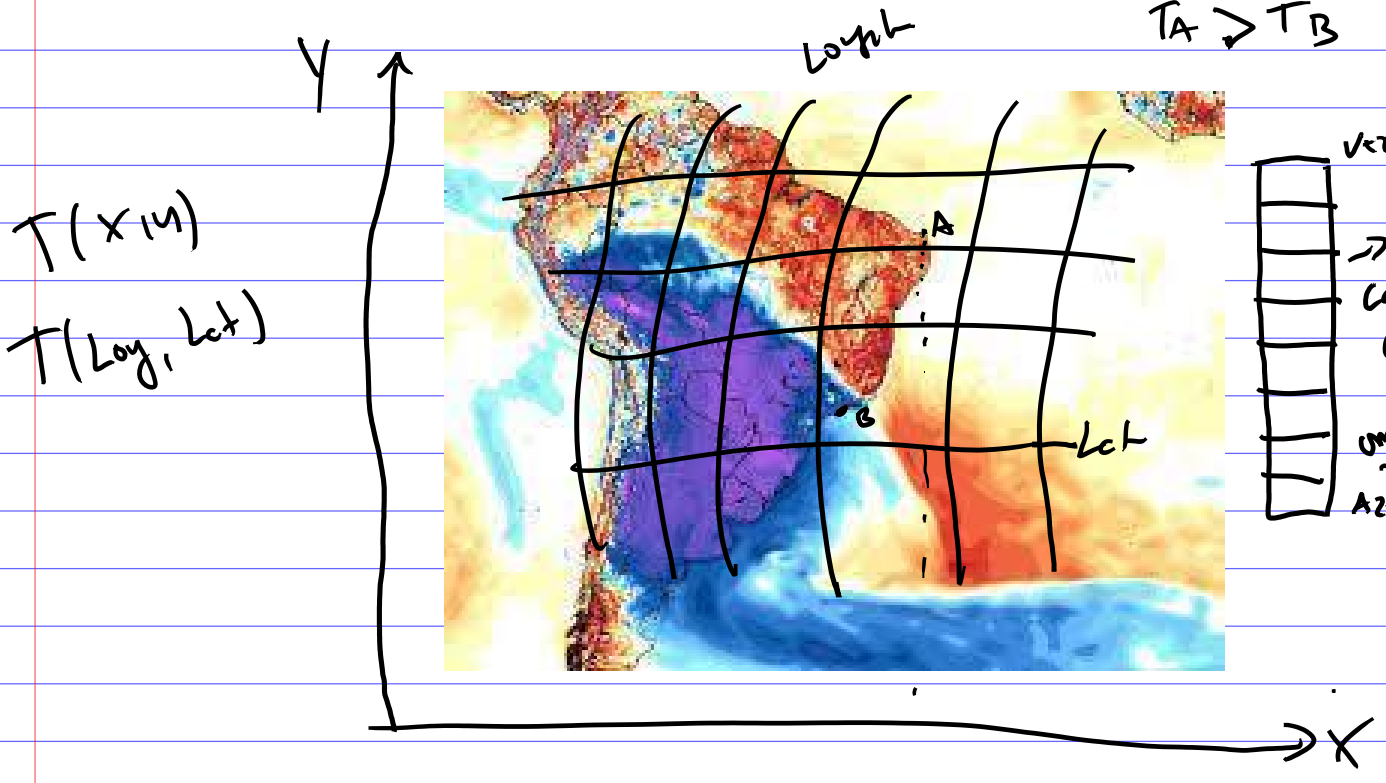
Velocidade do vento (km/h)

Temperatura real (°C) T \ v	5	10	15	20	25	30	40	50	60	70	80
5	4	3	2	1	1	0	−1	−1	−2	−2	−3
0	−2	−3	−4	−5	−6	−6	−7	−8	−9	−9	−10
−5	−7	−9	−11	−12	−12	−13	−14	−15	−16	−16	−17
−10	−13	−15	−17	−18	−19	−20	−21	−22	−23	−23	−24
−15	−19	−21	−23	−24	−25	−26	−27	−29	−30	−30	−31
−20	−24	−27	−29	−30	−32	−33	−34	−35	−36	−37	−38
−25	−30	−33	−35	−37	−38	−39	−41	−42	−43	−44	−45
−30	−36	−39	−41	−43	−44	−46	−48	−49	−50	−51	−52
−35	−41	−45	−48	−49	−51	−52	−54	−56	−57	−58	−60
−40	−47	−51	−54	−56	−57	−59	−61	−63	−64	−65	−67

Outra RepresentaÃ§Ã£o GrÃ¡fica de FunÃ§Ã£o de Duas Var



← $f(x,y) = x^2+y^2$

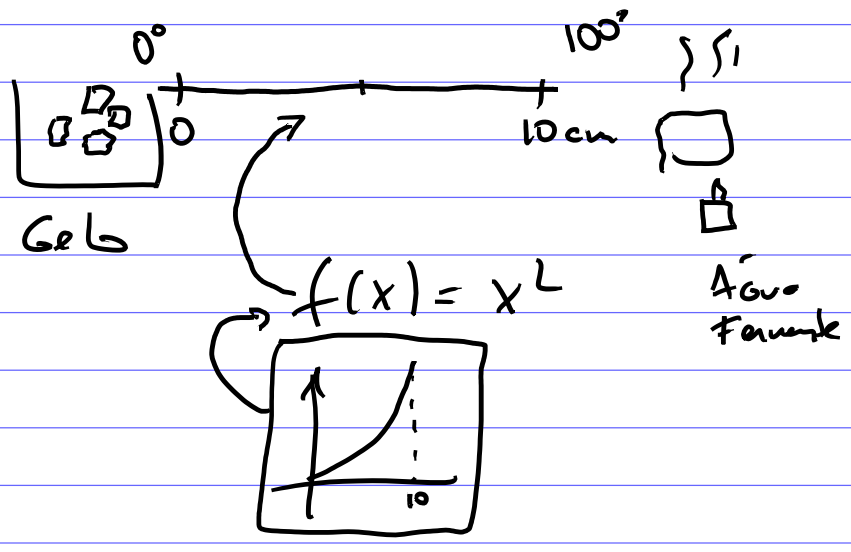


$T_A > T_B$

$T(x,y)$

$T(Long, Lat)$

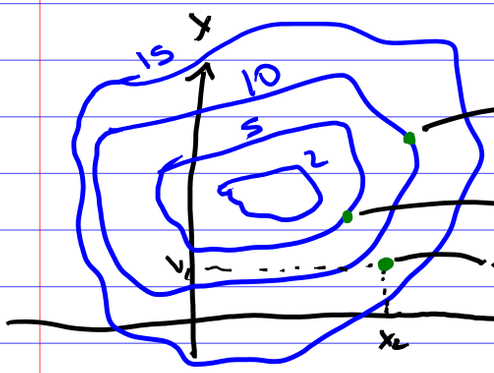
Vem cada cor é um número. Azul



E o vídeo? $T(x,y,t)$

É uma função tridimensional. Com (x,y,t)

Curvas de NÃ-vel



$f(x_0, y_0) = 10$

$f(x_1, y_1) = 5$

$f(x_2, y_2) \approx 12$ (Estimativa)

O Domínio é o $\mathbb{R}^2$

Analítica →

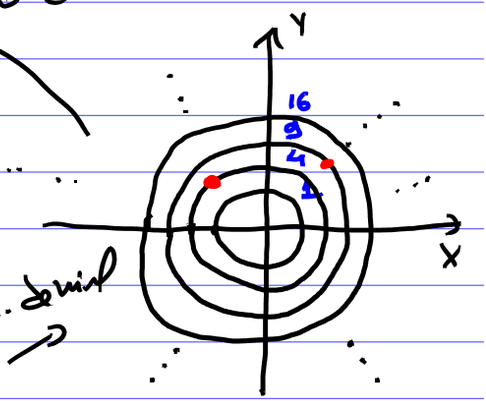
$f(x,y) = x^2 + y^2$

$1 = x^2 + y^2$

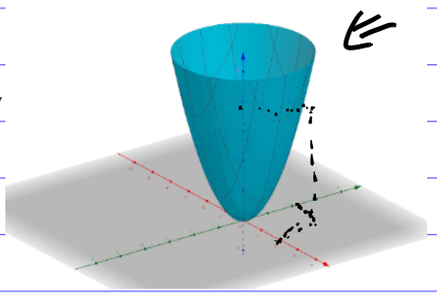
$4 = x^2 + y^2$

$9 = x^2 + y^2$

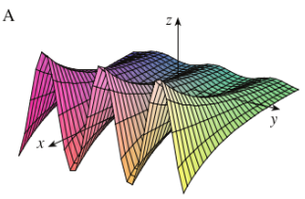
$16 = x^2 + y^2$ → Superfície



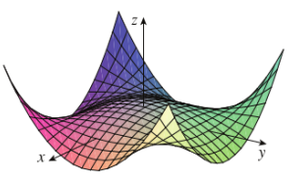
C. de nível →



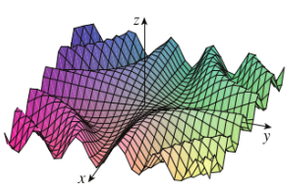
A



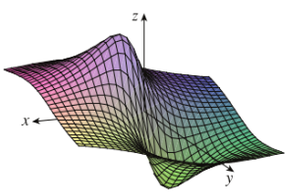
B



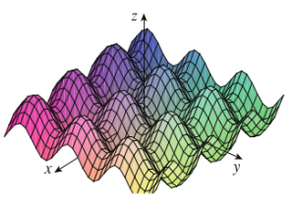
C



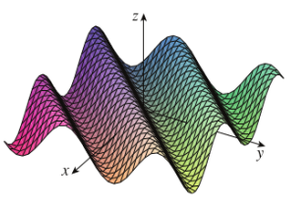
D



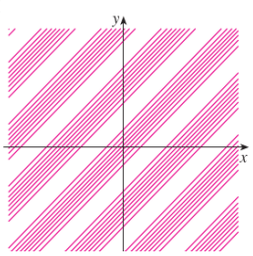
E



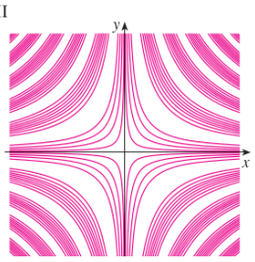
F



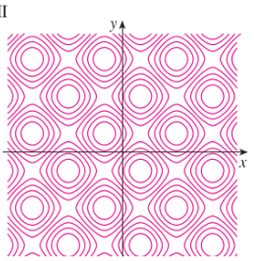
I



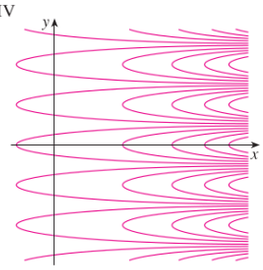
II



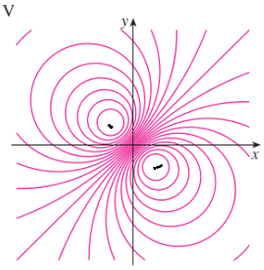
III



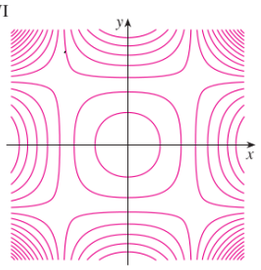
IV



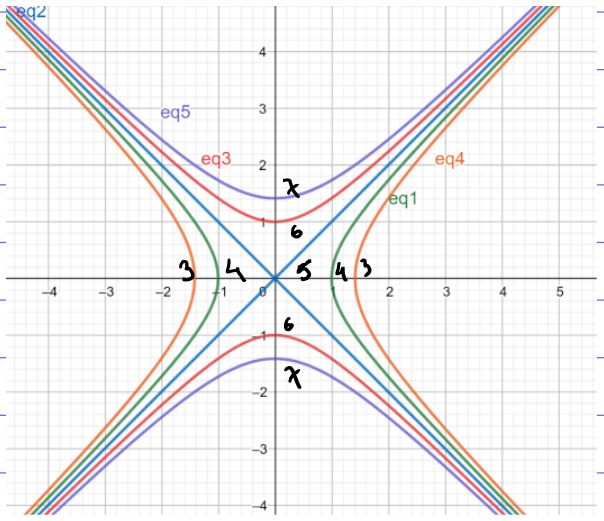
V



VI



Limites



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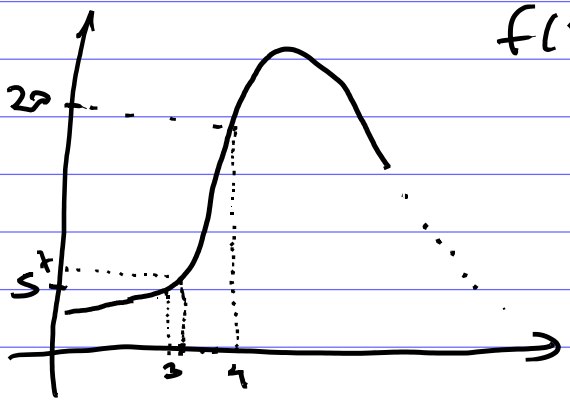
34	41	42	43	45	47	48	49	51	52
36	43	45	47	48	50	51	53	54	56

Temperatura real (°C)

a) $\lim_{(x,y)\to(2,-2)} \dfrac{x^2y + xy^2}{x^2 - y^2}$

b) $\lim_{(x,y)\to(0,0)} \dfrac{xy^2}{x^2 + y^2}$



$$f(3.1) = \frac{f(4) + f(3)}{2} = \frac{25}{2} = 12.5$$

Esfera

$$x^2 + y^2 + z^2 = 100$$

$$z^2 = 100 - x^2 - y^2$$

Hemisfério → $z = \sqrt{100 - x^2 - y^2}$

Quais são os níveis?

nível

$$0 = \sqrt{100 - x^2 - y^2}$$

$$0 = 100 - x^2 - y^2$$

$$x^2 + y^2 = 100$$

$$\sqrt{19} = \sqrt{100 - x^2 - y^2}$$

$$19 = 100 - x^2 - y^2$$

$$81 = x^2 + y^2$$