

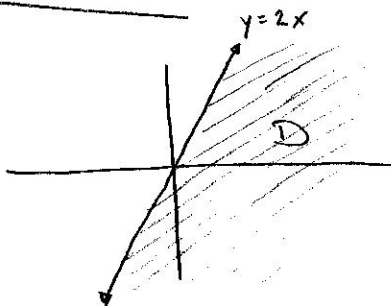
10/9/2014

5. $f(x,y) = \sqrt{2x-y}$

DOMAIN: $2x-y \geq 0$

D

$y \leq 2x$

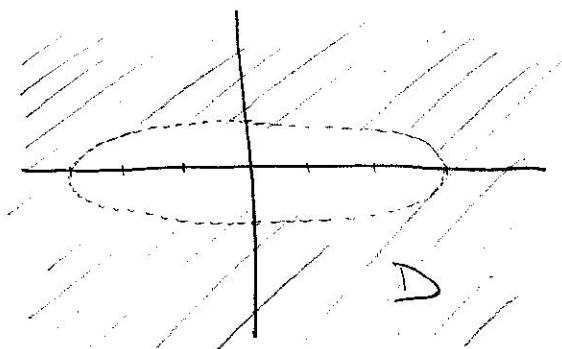


7. $f(x,y) = \ln(9-x^2-9y^2)$

DOMAIN D: $9-x^2-9y^2 > 0$

$9 > x^2 + 9y^2$

$1 > \frac{x^2}{3^2} + y^2$



9. $f(x,y) = \frac{\sqrt{y-x^2}}{1-x^2}$

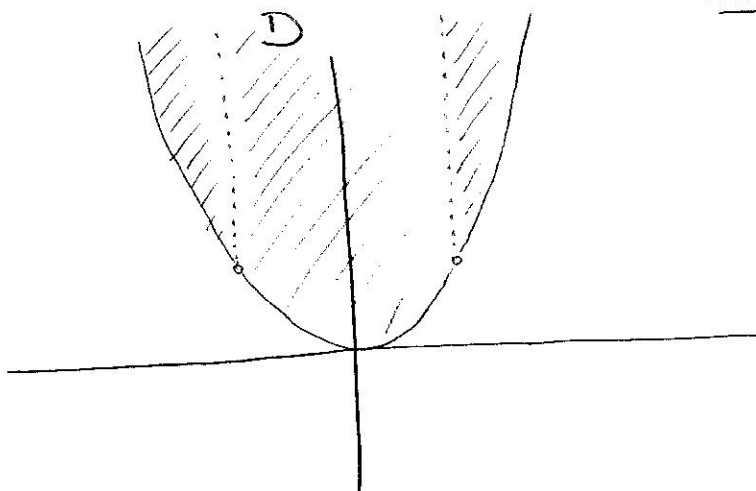
DOMAIN D: $y-x^2 \geq 0$ AND

$1-x^2 \neq 0$

$y \geq x^2$

$(1+x)(1-x) \neq 0$

$x \neq \pm 1$



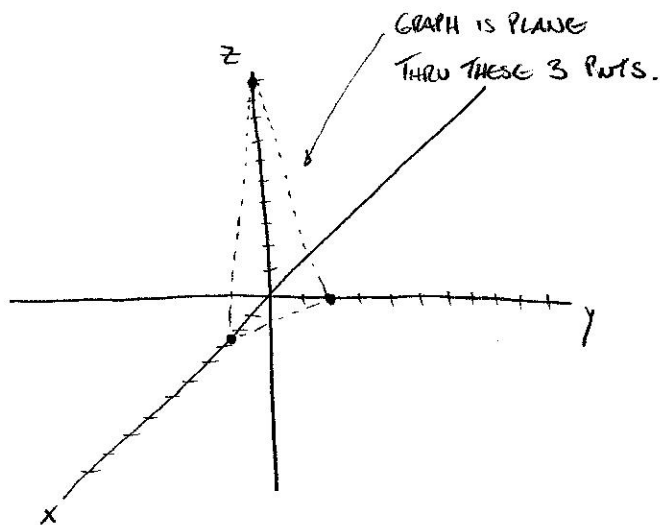
13. $z = 10 - 4x - 5y$

$4x + 5y + z = 10$ (PLANE)

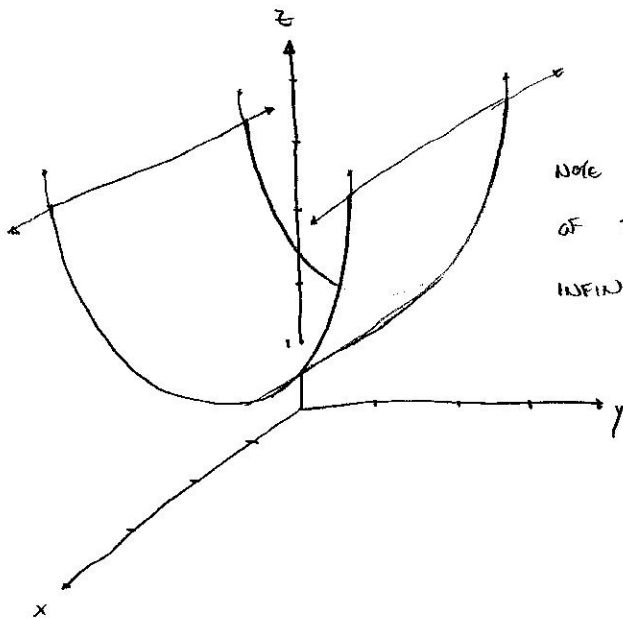
X-INTERCEPT ($y = z = 0$): $\frac{10}{4} = \frac{5}{2}$

Y-INTERCEPT ($x = z = 0$): $\frac{10}{5} = 2$

Z-INTERCEPT ($x = y = 0$): 10



15. $z = y^2 + 1$ (CYLINDER)



NOTE THAT I'VE ONLY DRAWN PART OF THE CYLINDER (WHICH WOULD EXTEND INFINITELY LONG & TALL)

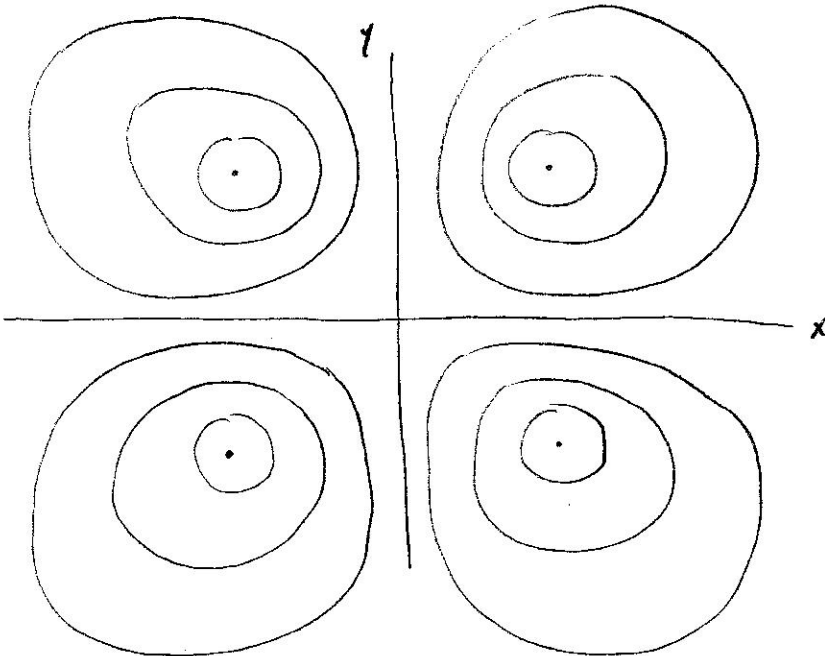
22. I. IS A PARABOLOID BECAUSE THE LEVEL CURVES ARE FARTHER APART NEAR ORIGIN (SO "SURFACE IS LESS STEEP") & CLOSER TOGETHER AWAY FROM ORIGIN (SO "SURFACE IS MORE STEEP").

II. IS A CONE BECAUSE LEVEL CURVES ARE EVENLY SPACED (SO "SURFACE STEEPNESS" IS CONSTANT).

23. NEAR A: VERY STEEP (CONTOUR LINES CLOSE TOGETHER)

NEAR B: FAIRLY LEVEL (CONTOUR LINES FAR APART)

24.



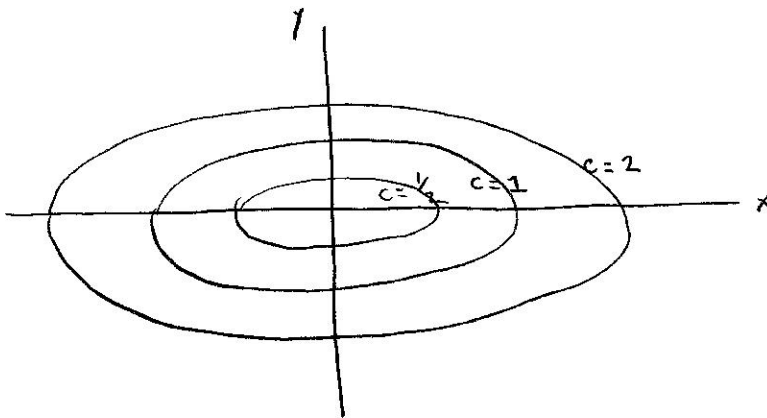
NOTE THAT x & y AXES
ARE CONTOUR CURVES AS
WELL.

26. $f(x,y) = \ln(x^2 + 4y^2)$; DOMAIN: $x^2 + 4y^2 > 0$
 $(x,y) \neq (0,0)$

CONTOUR: $\ln(x^2 + 4y^2) = c$ ← CONSTANT

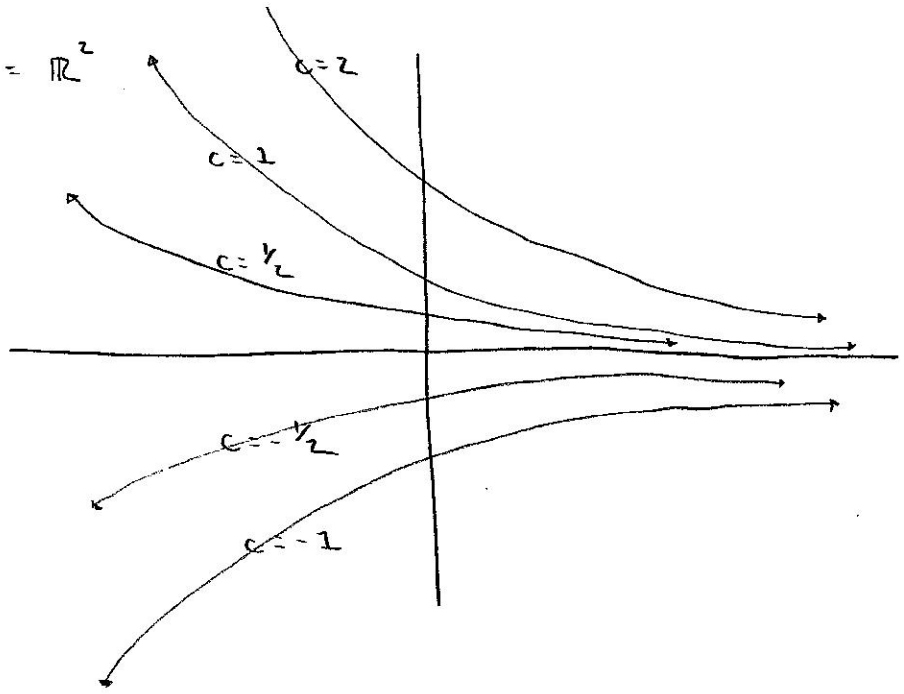
$x^2 + 4y^2 = e^c$ ← POSITIVE CONSTANT

$\frac{x^2}{2^2} + y^2 = \frac{e^c}{4}$ ← JUST ANOTHER ARBITRARILY POSITIVE CONSTANT



21. $f(x,y) = ye^x$; DOMAIN = \mathbb{R}^2

contour: $ye^x = c$
 $y = ce^{-x}$



50. $f(x,y) = y \sec x$; DOMAIN : $x \neq \frac{\pi}{2} + n\pi$, $n = 0, \pm 1, \pm 2, \dots$

contour: $y \sec x = c$

$\sec x = \frac{c}{y} \rightarrow \text{i.e. } \frac{1}{\cos x} = \frac{c}{y}$

$y = c \cos x$

