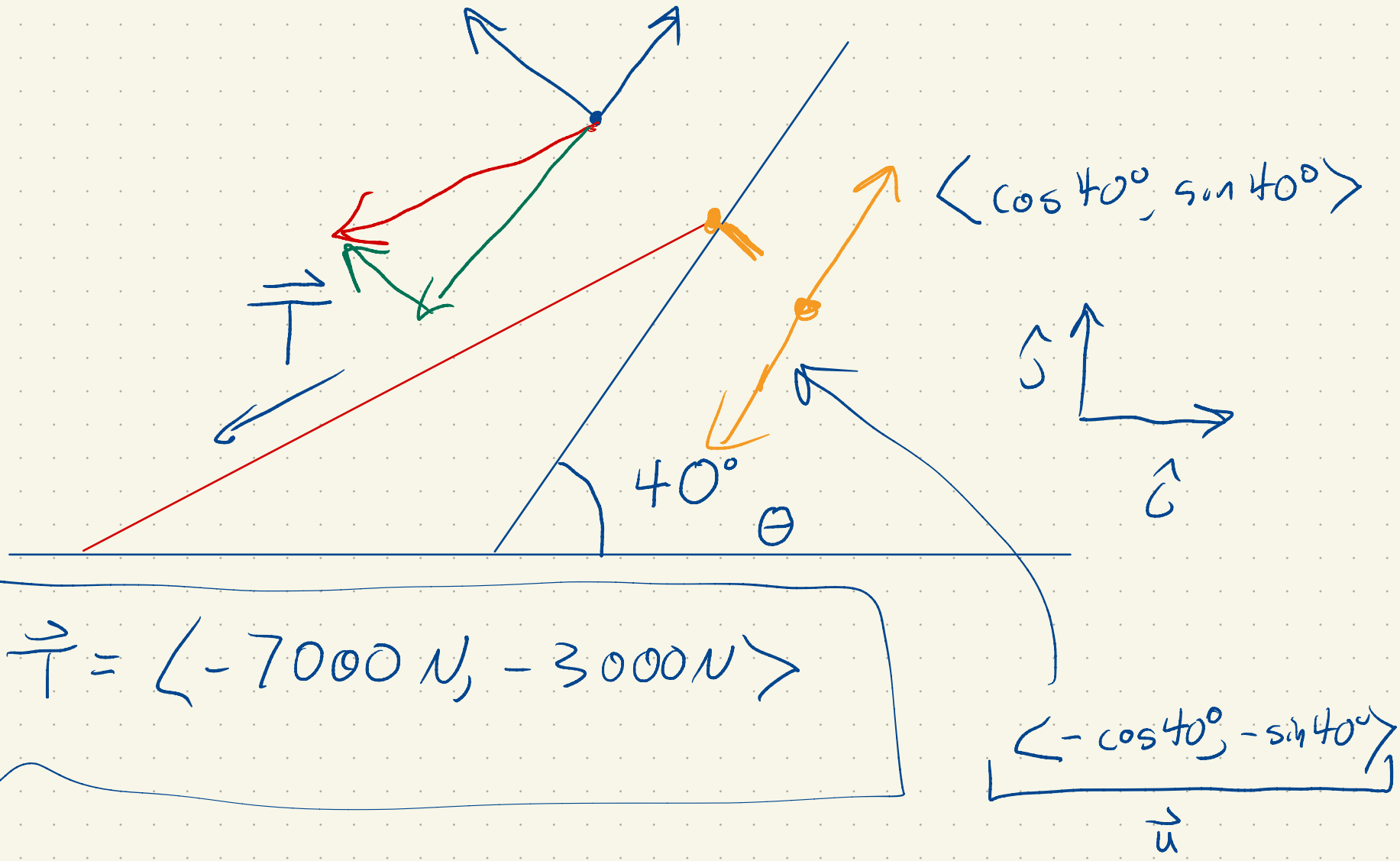


$$\vec{T} = \langle -7000\,N, -3000\,N \rangle$$

Shear force: $\vec{T} \cdot \vec{u}$ $(\vec{u})$

$$\langle -7000, -3000 \rangle \cdot \langle -\cos 40°, -\sin 40° \rangle$$

$\cdot \langle -0.766, -0.642 \rangle$

$= 7290\ N$

Shear force: $7290 \langle -\cos(40°), -\sin(40°) \rangle$

$\vec{v} \quad \vec{w}$

$$\frac{\vec{v} \cdot \vec{w}}{\|\vec{w}\|^2} \vec{w} = \left[\vec{v} \cdot \left(\frac{\vec{w}}{\|\vec{w}\|} \right) \right] \left(\frac{\vec{w}}{\|\vec{w}\|} \right)$$

$\vec{v} = \langle 300\ m/s, -62\ m/s \rangle$

$= 300\,\hat{\imath}\ m/s - 62\,\hat{\jmath}\ m/s$

$-\hat{j}$

$\vec{v} \cdot (-\hat{j}) = 62 \text{ m/s}$

$PV = nRT$

gas constant

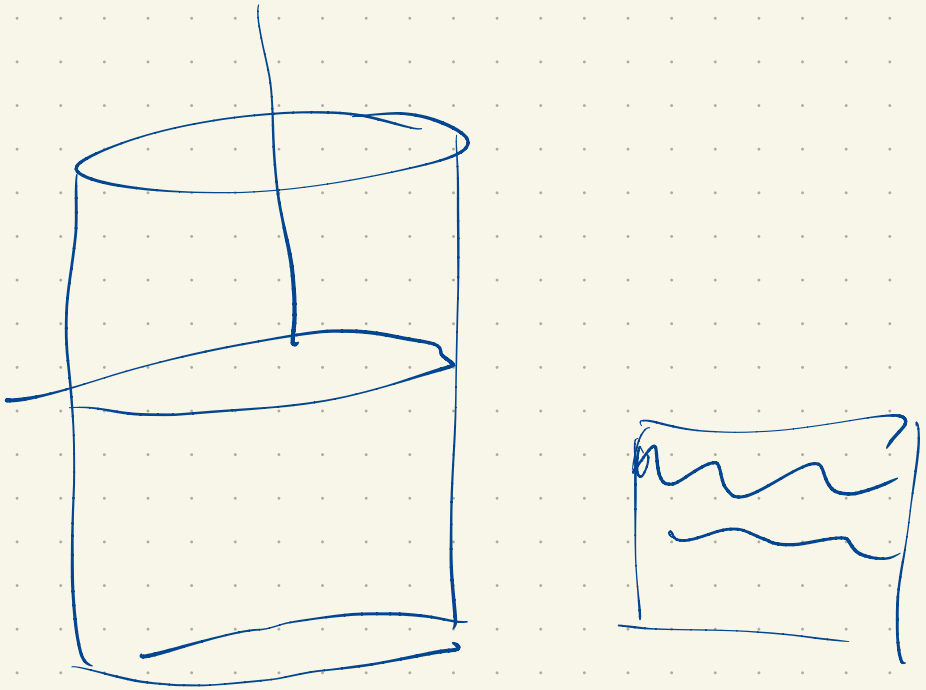
temperature (K)

pressure

volume

# of particles

Suppose n is fixed but V and T can be adjusted

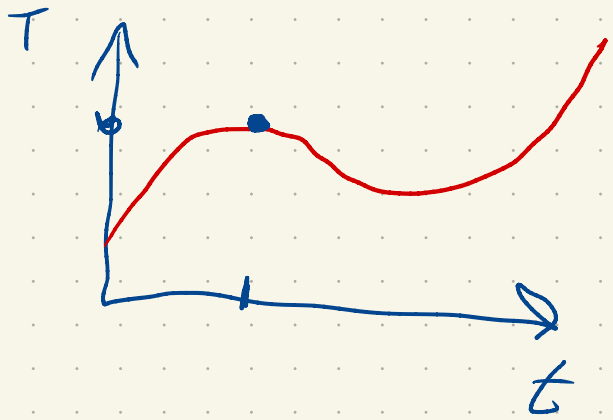


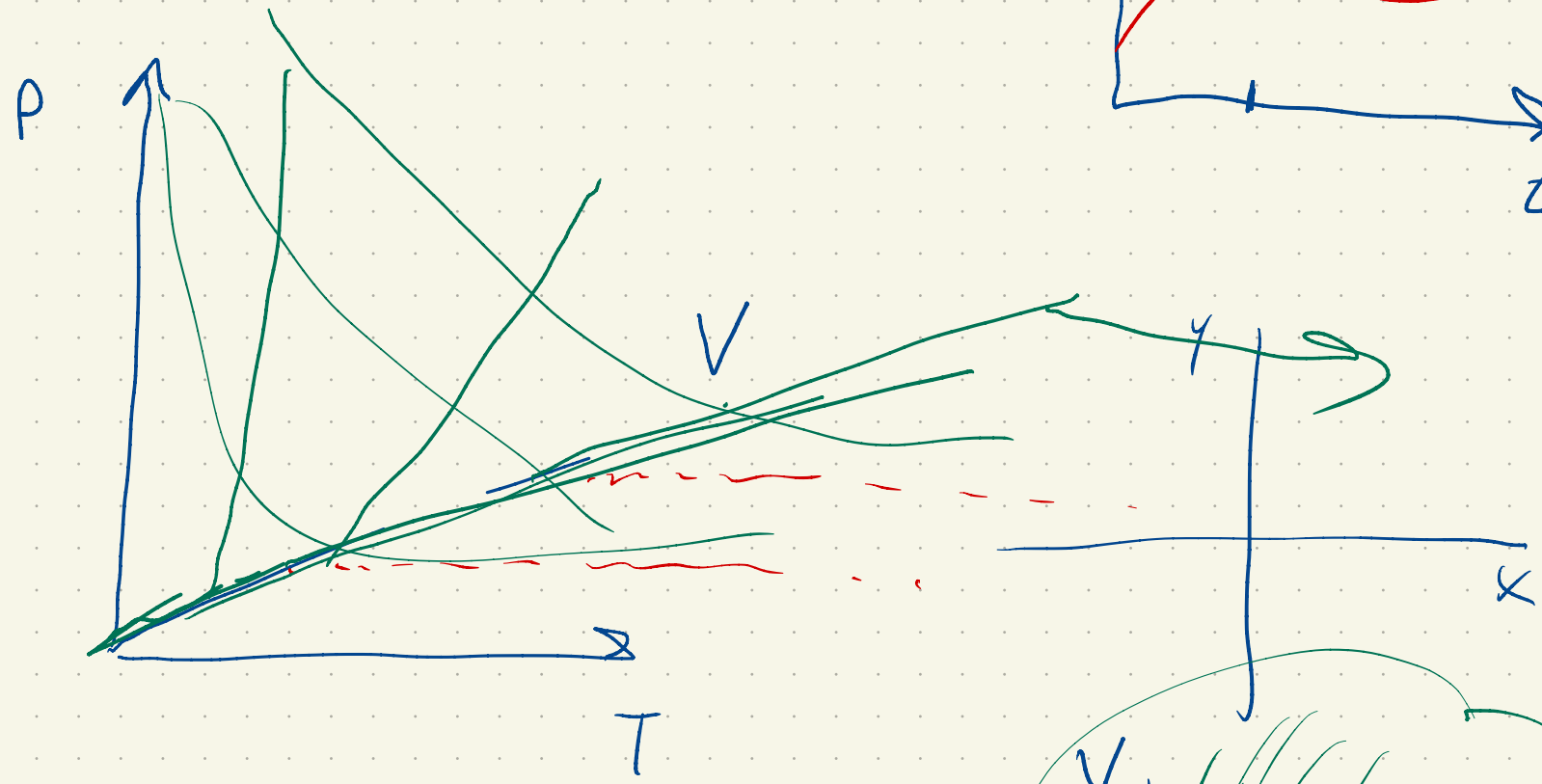
$$P = (nR)\,T/V$$

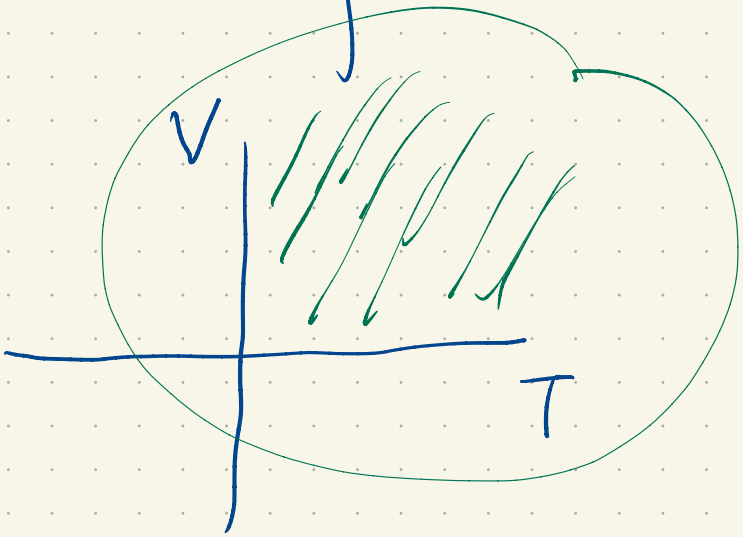
"pressure is a function of volume and temperature"

$$y = kx$$

$$P = (nR)\,T/V$$







domain → all available inputs

range → all valid outputs

$$P = nR\frac{T}{V}$$

$T > 0$

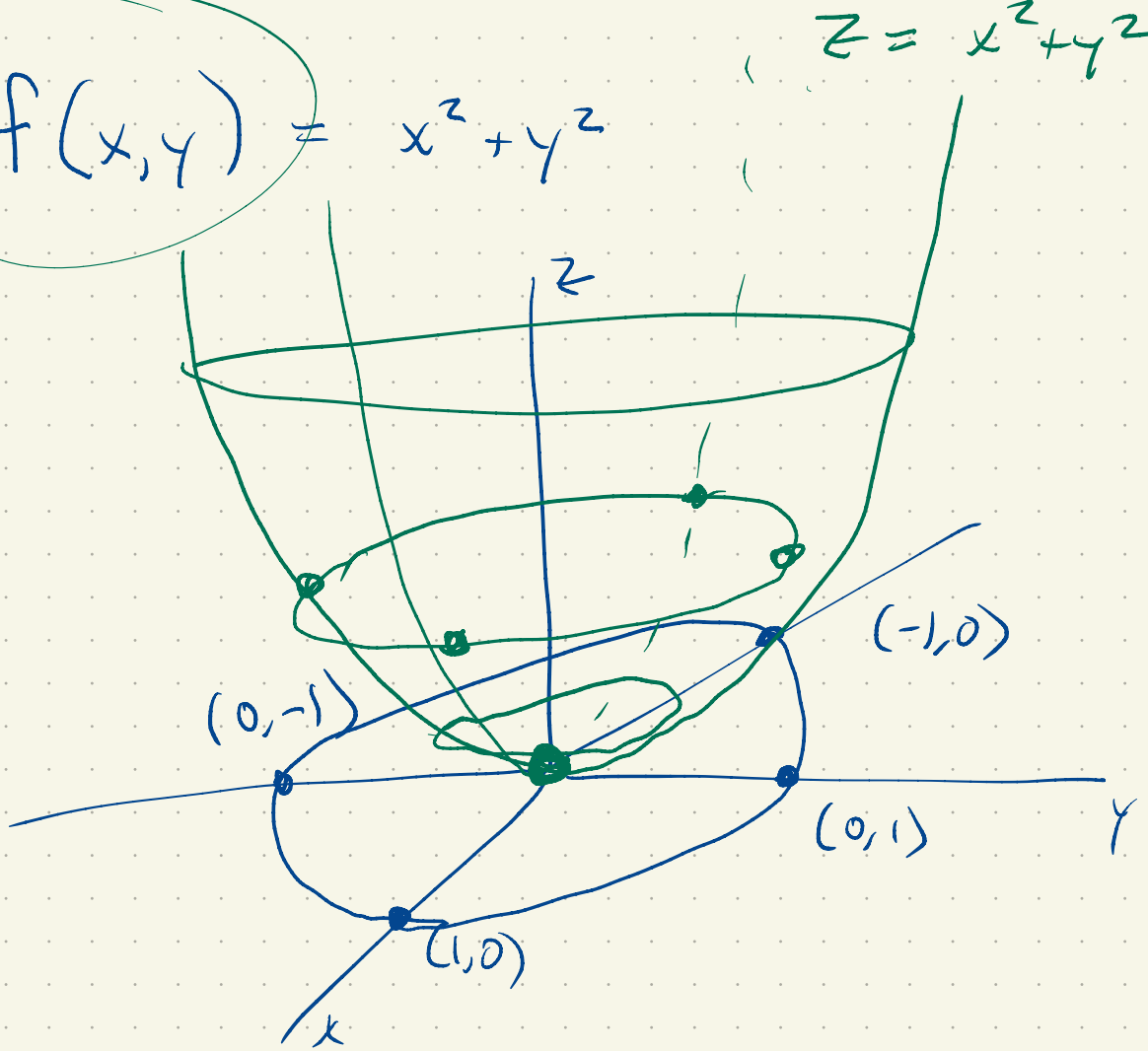
$V > 0$

domain: $\{T, V : T > 0,\ V > 0\}$

range: $P > 0$

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

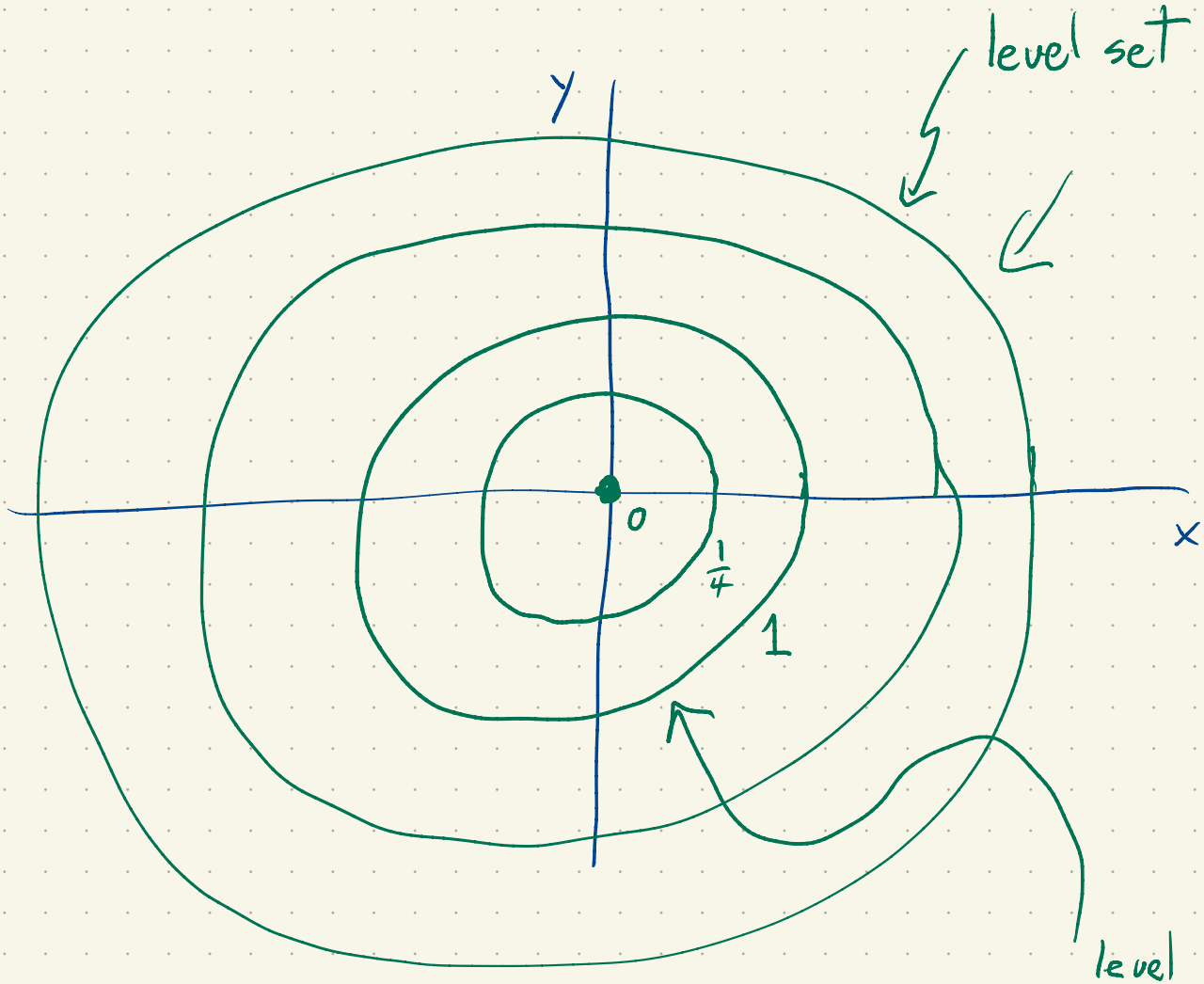
$z = x^2 + y^2$



$x^2 + y^2 = 1$

$x^2 + y^2 = \frac{1}{4}$

Graph.



"contour plot"

level set of

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

c

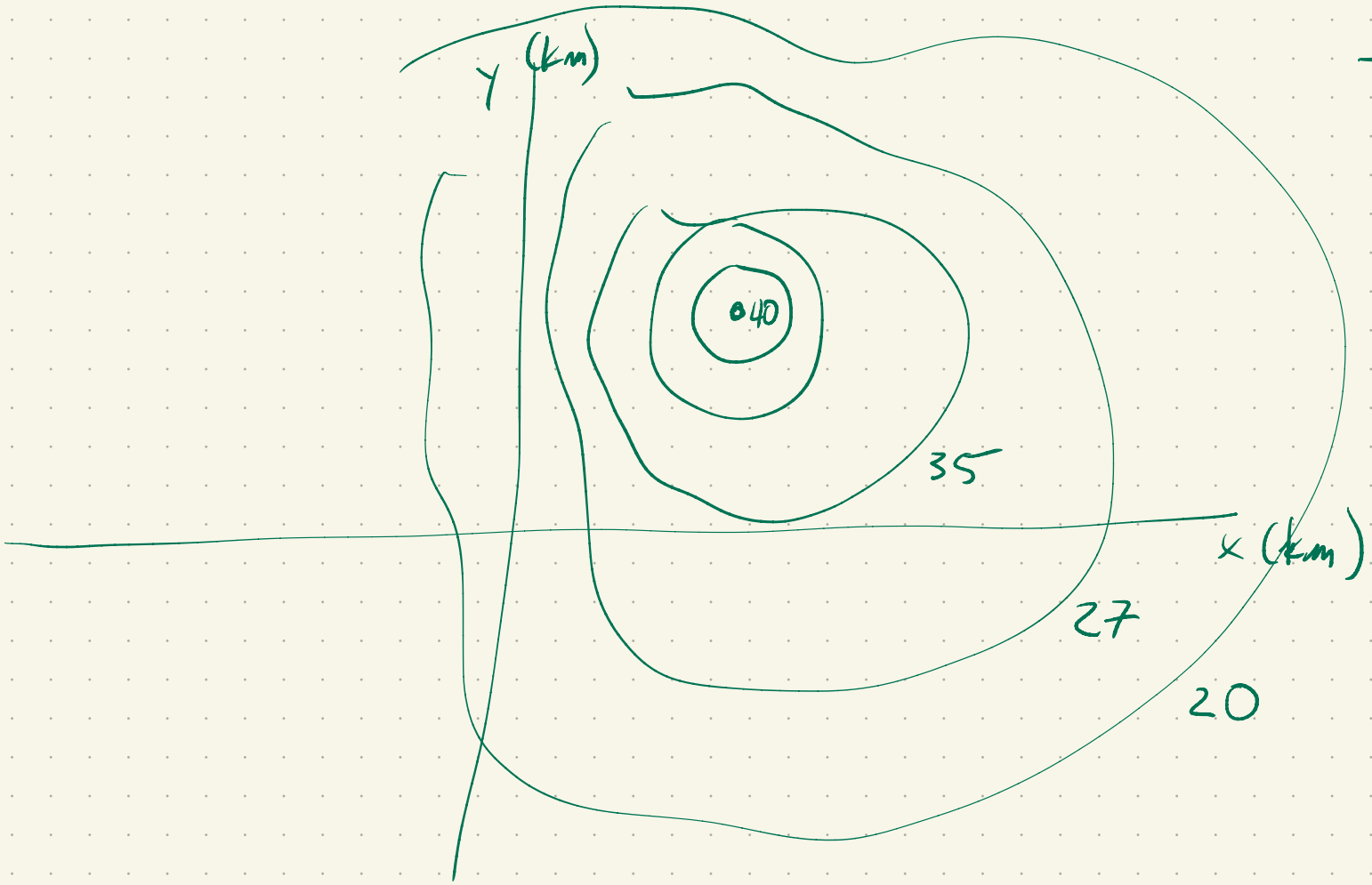
$f(x,y) = c$

$c = 1$

$x^2+y^2 = 1$

$c = \frac{1}{4}$

$x^2+y^2 = \frac{1}{4}$



$T = f(x, y)$

$h = f(x, y)$

↑ (mm)