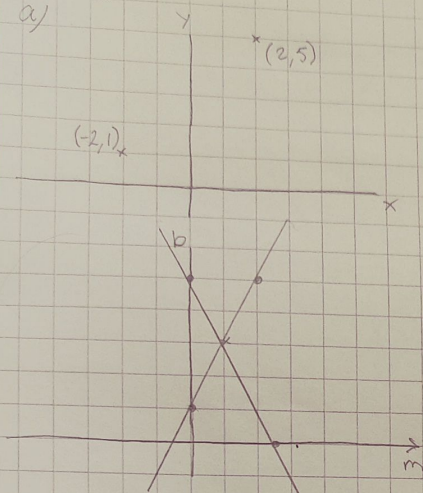Ex round 4   Daniel Kusnetoff
Task 1.

a)

$(x_0, y_0) = (-2, 1)$
$(x_1, y_1) = (2, 5)$

$(2,5)$

$(-2,1)$

$b = -x_0 m + y_0 = -(-2) \cdot m - 1$
$b = -x_1 m + y_1 = -(2) \cdot m + 5$

$(m', b') = (1, 3)$

b)

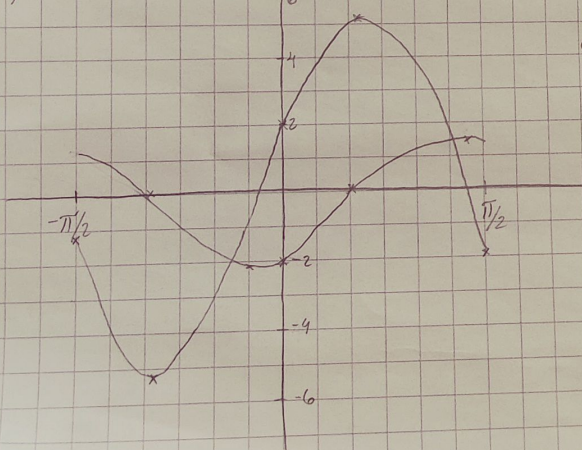$$y = \frac{-\cos(\theta)}{\sin(\theta)} x + \frac{\rho}{\sin(\theta)}$$

$$\rho = x \cdot \cos(\theta) + y \cdot \sin(\theta)$$

ρ = norm distance from line of origin

θ = angle between the norm and x-axis

$\rho = 2 \cdot \cos(x) + 5 \cdot (\sin(x))$
$\rho = -2 \cdot \cos(x) + 1 \cdot \sin(x)$

crosses at $(-0.79; -2, 12)$
$(2, 35; 2, 1)$

task 1.
c)

In cartesian cordinate system the value of the slope is undefined.
This leads to the issue, that the vertical lines require infinite
values of m. Polar coordinate form does not have the issue

Another issue that the cartesian coordinates have is that
it has unbounded parameter domains. The polar form
is also therefore a good alternative to cartesian form.