slope-intercept equation $y = mx + b$

point-slope eq. $y - y_0 = m(x - x_0)$

Ex1 $y = 2x - 4$

$y - 5 = 2(x - 3)$

general linear equation $Ax + By = C$

circle, radius r, center (h,k) $(x-h)^2 + (y-k)^2 = r^2$

translation when graph of equation is translated h units to right, k units up, the new equation has x replaced w/ $x-h$, y repl. w/ $y-k$

Ex3 $x^2 + y^2 - 4x + 6y = 12$

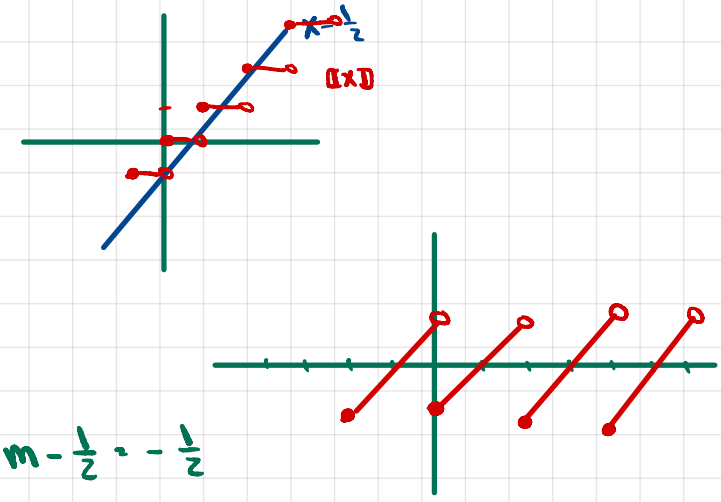
$x^2 - 4x + 4 + y^2 + 6y + 9 = 12 + 4 + 9$

$(x-2)^2 + (y+3)^2 = 25$, circle center $(2,-3)$ $r = 5$

graph of a function is special case of graph of an equation.
graph of $f(x)$ is graph of $y = f(x)$

A circle is not the graph of a function, it is the graph of an equation.

Ex7 $f(x) = x - [\![x]\!] - \frac{1}{2}$



$g(x) = [\![x]\!]$

given $x = n \in \mathbb{Z}$
$g(n) = n$

$g(x) = n$ for $x \in [n, n+1)$

For $m \in \mathbb{Z}$, $f(m) = m - m - \frac{1}{2} = -\frac{1}{2}$

For $x \in [n, n+1)$, $n \in \mathbb{Z}$, $f(x) = x - n - \frac{1}{2}$

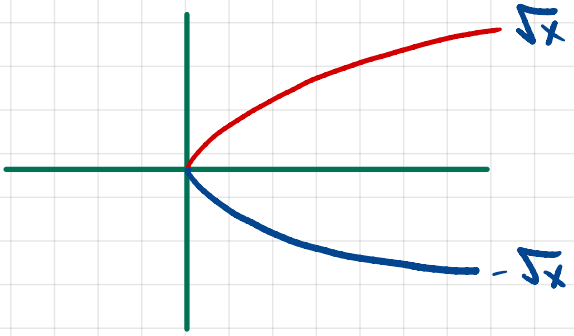
$x \in [0,1)$ $f = x - \frac{1}{2}$
$x \in [1,2)$ $f = x - 1 - 1/2 = x - 3/2 = (x-1) - \frac{1}{2}$

↳ translation 1 unit to right

Ex 9

$f(x) = \sqrt{x}$

x	f(x)
1	1
4	2
9	3
16	4



$g(x) = -\sqrt{x}$

Ex 10 $y = 2x^2 - 4x - 1$

$y = 2(x^2 - 2x + 1) - 1 - 2$

$y + 3 = 2(x-1)^2$

parabola with vertex at $(1, -3)$