8) $f = x^2 - 1$

$g = \frac{1}{x-1}$

$\frac{1}{(x^2-1)-1}$

$(g \circ f)(x)$ $\frac{1}{x^2-2}$

$x^2 - 2 \neq 0$

$\sqrt{x^2} \neq \sqrt{2}$

$x \neq \pm\sqrt{2}$

$D: (-\infty, -\sqrt{2}) \cup (-\sqrt{2}, \sqrt{2}) \cup (\sqrt{2}, \infty)$

$5^2 = \sqrt{25}$

$(-5)^2 = \sqrt{25}$

$(f \circ g)(x) = \sqrt{1 - x^4}$

$[-1, 1]$

Last in 1.4

Relation vs. **Function**

set of order pairs — every x has one y

Ex6 Is this a function?

with $(2,-5), (1,3), (2,1)$ defined by $x^2y + y^2 = 5$

$2^2(-5) + (-5)^2 \stackrel{?}{=} 5$

$-20 + 25$

$5 = 5$ ✓

$2^2(1) + (1)^2 \stackrel{?}{=} 5$

$5 = 5$ ✓

$1^2(3) + (3)^2 \stackrel{?}{=} 5$

$3 + 9$

$12 \neq 5$

We know $(2,-5)$ and $(2,1)$ worked, however $x^2y + y^2 = 5$ is **NOT** a function

- $x^2 + y^2 = 36$

$(-4, 4.47)$ ✓, $(-2, 8)$ ✗, $(-4, -4.47)$ ✓

Is it a function?

NO

Circle function

$x^2+y^2=r^2$

where r is the radius of the circle

$x^2+y^2=36$

radius: 6

As a whole equation does not result in a function, it can be split into two equations that then are each functions themselves

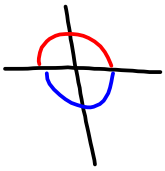
$x^2+y^2=36$

Solve for y

$y^2=36-x^2$

$y=\pm\sqrt{36-x^2}$

$y=\sqrt{36-x^2}$ $y=-\sqrt{36-x^2}$



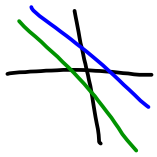
implicitly

Ex7 $x^2+2xy+y^2=1$

$(x+y)^2=1$

$x+y=\pm\sqrt{1}=\pm1$

$y=-x-1$ $y=-x+1$



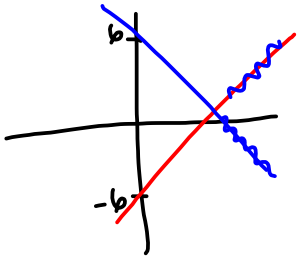
- $x+|y|=6$

$-x \quad -x$

$|y|=-x+6$

$y=+(-x+6)$ $y=-(-x+6)$

$y=-x+6$ $y=x-6$



✓

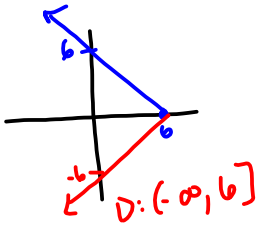
Vertex is when you solve for x and know y=0

$x+|y|=6$

$x=-|0|+6$

$x=6$

vertex (6,0)



p125 #35, 36, 37-44

sketch little graphs for 37-44