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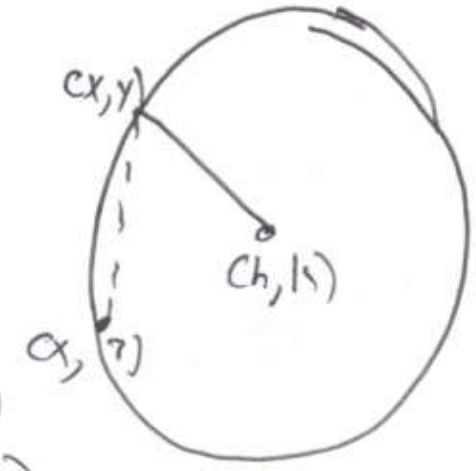
Notes 24/08/2010

Sect 1.1
Circles

The circle with a center (h, k) and radius r > 0

(h, k) — center point



is the set of all points (x, y) that are distance r from (h, k)

$$\text{distance} = \sqrt{(\Delta x)^2 + (\Delta y)^2}$$

$$\text{circle} = r = \sqrt{(x-h)^2 + (y-k)^2}$$

$$r^2 = (x-h)^2 + (y-k)^2$$

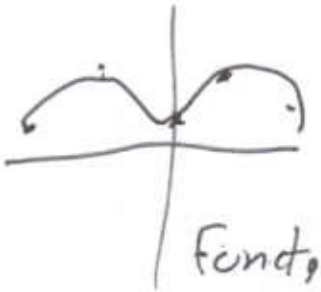
How to do Online Hw

- Link is provided within hw page with info how to input equations
- Located on the right side of the page
- Unlimited tries on assignments

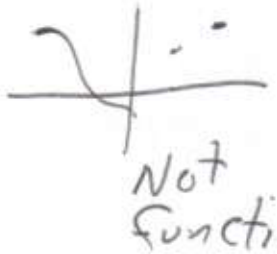
Plan for today

- Finish Sect 1.1
- Start Sect 1.2
  - absolut values
  - functions
  - compositions

Sect 1.2
A function is a set of points in a plane where you never have 2 points with the same x-coordinate

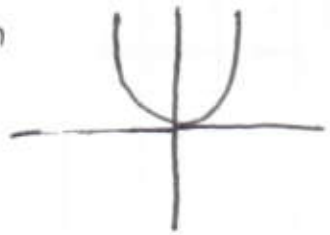


Function



Not function

$F(x) = x^2 + 3$ is a function



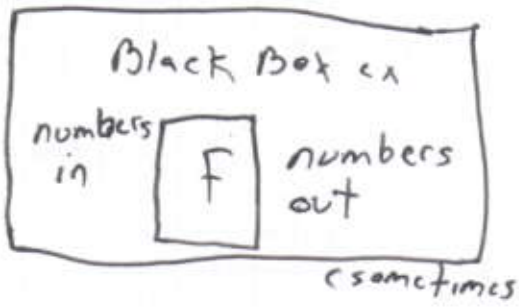
all points (a, a^2+3) where $-\infty < x < \infty$

$F(x) = 1/x$

$x \rightarrow [f] \rightarrow 1/x$

$0 \rightarrow [f] \times$ DNE - does not exist

~~DN~~ NO - Not define

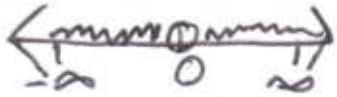


(sometimes)

Domain - x cordinate value expressed in real numbers

- is the set of ~~points~~ real x's is define

$F(x) = 1/x \Rightarrow$ dom(f) is $(-\infty, 0) \cup (0, \infty)$



$g(x) = \sqrt{x}$ domain(g) = $[0, \infty)$

$x \neq -x$

$h(x) = \sqrt{9 - x^2}$ domain (h) = $[-3, 3]$

$h(2) = \sqrt{9-2^2} = \sqrt{9-4} = \sqrt{5} \rightarrow$ 2 is in domain

$h(4) = \sqrt{9-4^2} = \sqrt{9-16} = \sqrt{-7} \rightarrow$ 4 is not in domain

domain (h) $\{x : 9 - x^2 \geq 0\}$

set of all x where $9 - x^2 \geq 0$

$9 - x^2 > 0$

$9 \geq x^2$

$\sqrt{9} \geq \sqrt{x^2}$

$3 \geq |x|$

(continue)

By definition $|x| = \sqrt{x^2}$

$|x| = abs(x)$ = absolute value of x — Geometric explanation

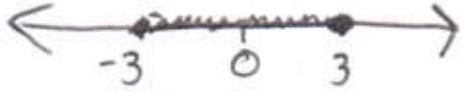
$|2| = \sqrt{2^2} = \sqrt{4} = 2$

$|-2| = \sqrt{(-2)^2} = \sqrt{4} = 2$

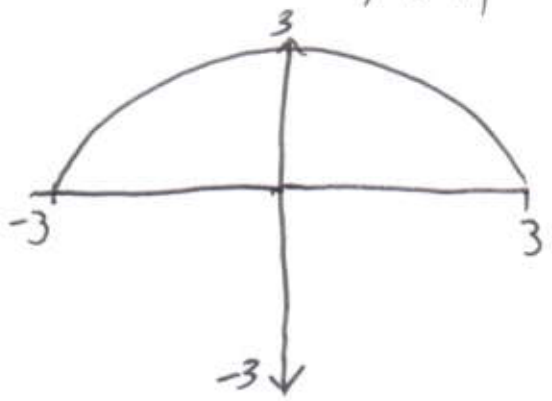
$|x| = \sqrt{x^2}$ = distance from 0 to x (on the number line)

$\sqrt{x^2+y^2}$ = distance from $(0_x, 0_y)$ to (x, y) in a plane

← (continued)



$y = h(x)$



$y = h(x)$

$y = \sqrt{9-x^2}$

$$\begin{cases} y^2 = 9 - x^2 \\ y \geq 0 \\ x^2 + y^2 = 3^2 \end{cases}$$

$|2| = 2$

$|-2| = 2 = -(-2)$

$$|x| = \begin{cases} x \text{ if } x \geq 0 \\ -x \text{ if } x \leq 0 \end{cases}$$

$h(x) = \sqrt{9-x^2}$

$h(x-9) = \sqrt{9-(x-4)^2}$

$h(x) - 4 = \sqrt{9-x^2} - 4$