Lesson 8

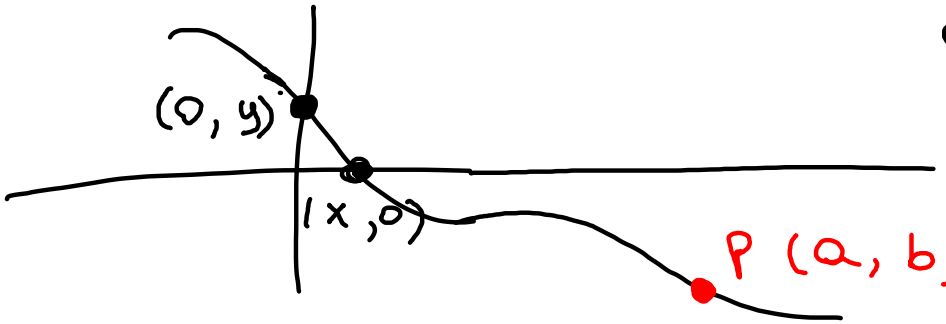
Read Chapter 5 and Chapter 6

Functions,domain range

Multipart functions

semicircles

x and y intercepts



Given $y = f(x)$
To find y intercept calculate $f(0)$, if 0 is in domain of f
To find x intercept(s) set $f(x) = 0$ and solve for x

There is at most 1 y intercept
There can be any number of x intercepts
(including none)

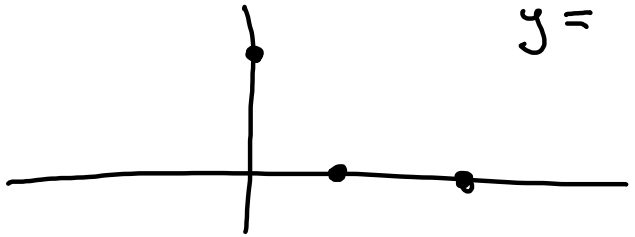
Find x and y intercepts for $f(x) = x^2 - 5x + 6$

$y = x^2 - 5x + 6$

1) For y intercept : $x = 0$ compute $f(0) = 6$ $(0, 6)$

2) For x intercept : $y = 0$ solve $0 = x^2 - 5x + 6$ .... $x = 2, 3$

$(2, 0)$ $(3, 0)$



Domain=set of all allowed inputs

If we have a formula y=f(x), NATURAL DOMAIN is all x that I can plug into the formula
but
there maybe other restrictions. Recall Ann and Bob problem:
$y(t)=10+6(t-15)$, $t \geq 15$

Find the (natural) domain of $f(x) = \frac{\sqrt{x+1}}{x-5}$

In EXPR requires $\text{EXPR} > 0$

$\sqrt{\text{EXPR}}$ requires $\text{EXPR} \geq 0$

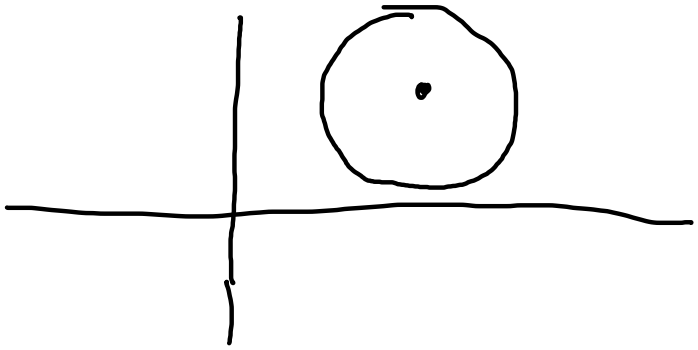
$\frac{\text{SOMETHING}}{\text{EXPR}}$ requires $\text{EXPR} \neq 0$

Algebraic manipulations

Given $f(x) = \frac{\sqrt{x+1}}{x-5}$ calculate $f(1+h)$

Given $f(x) = \sqrt{x-8}$ simplify $\frac{f(x+h)-f(x)}{h}$ enough so that plugging in $h = 0$ is allowed

Given $(x-1)^2 + (y-2)^2 = 9$ solve for y



Given $(x - x_0)^2 + (y - y_0)^2 = r^2$

Top semicircle is $y = y_0 + \sqrt{r^2 - (x - x_0)^2}$

Bottom, semicircle is $y = y_0 - \sqrt{r^2 - (x - x_0)^2}$