

## Task

Reproduce the following pdf document using latex: [homework5.pdf](#)

In the email attach the .tex and the .pdf files only.

## Help

These are the commands that we didn't use on the practical or the lecture, but are still required to create some of the formulas in the homework:

```
\lim      % limit, example: \lim_{x\rightarrow \infty}
\in      % element symbol
\notin   % element symbol striked through
\cos     % cosinus
\sin     % sinus
\cdot    % center dot (to emphasize multiplication)
\qquad  % big space in math mode
\mapsto  % "maps to" arrow
\backslash % backwards slash: \
\ln     % logarithm
\prod   % product
\sqrt[k]{n} % kth root of n
\min   % minimum
\max   % maximum
```

For most sections I used the **align\*** environment to write stuff in multiple lines, using the following format:

```
\begin{align*}
& formula1 && formula2 && formula3, \\
& formula4 && formula5 && formula6
\end{align*}
```

The first & aligns the formulas, and every second & creates some whitespace between the formulas.

I used the following format for the **cases** enviroment:

```
function \qquad x \mapsto \begin{cases}
value1, &\text{if } condition1 \\
value2, &\text{if } condition2
\end{cases}
```

A little help with the title: you can put a \\(newline) command in the title as well.