

# Example worksheet

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This is an example worksheet with exercises denoted by big `tcolorbox`s.

## 1 Files

There is a `\filename` macro for typesetting filenames. This is useful for specifying submission structure.

Add your code to `\filename{class1.ml}`

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## 2 Tasks

```
\newmintinline{ocaml}{}  
\newcommand{\theFile}{\filename{class1.ml}}
```

`\begin{task*}` [Some un-numbered task]

All tasks will be marked with a `\color{red!75!black} red` box!

These must all be completed for full marks.

`\end{task*}`

`\begin{task}` [Numbered task]

`\label{task:increment}`

In `\theFile`, define a new function named `\ocamlinline/increment/` which  
→ takes a single argument and adds 1 to it.

Your function must have type `\ocamlinline/int -> int/`.

`\end{task}`

### Some un-numbered task

All tasks will be marked with a `red` box! These must all be completed for full marks.

### Task 1: Numbered task

In `class1.ml`, define a new function named `increment` which takes a single argument and adds 1 to it. Your function must have type `int -> int`.

## 3 Solutions

```
\begin{solution*}[to Task~\ref{task:increment}]  
\mintinline{ocaml}{let increment x = x + 1}  
\end{solution*}
```

### Solution to Task 2

```
let increment x = x + 1
```

## 4 Examples

```
\begin{example*}[Example proof using induction over the naturals]
\begin{lemma}[$3^n - 1$ is even]
\label{lemma:power-of-three-even}
$$\forall n. \exists x. 3^n - 1 = 2x$$
\end{lemma}
\begin{proof}[Proof of Lemma~\ref{lemma:power-of-three-even}]
\ldots
\end{proof}
\end{example*}
```

### Example proof using induction over the naturals

**Lemma 1** ( $3^n - 1$  is even).

$$\forall n. \exists x. 3^n - 1 = 2x$$

*Proof of Lemma 1.* ...

□

## 5 Margin notes

Margin notes are set up somewhat sensibly.

```
\marginpar{This text is nonsense, and this note isn't very helpful
\lipsum[1]
```

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This text is nonsense, and this note isn't very helpful either.