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# TEMPLATE TITLE

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Subtitle

**Author**

Who?

Where?

When?

# Contents

# 1 Examples

**Theorem 1.1.** This is a theorem.

**Proposition 1.2.** This is a proposition.

**Principle 1.3.** This is a principle.

## 1.1 Pictures



Figure 1: Sydney, NSW

## 1.2 An Electric Bill Optimization Problem

Suppose we wish to find a function  $x(t)$  to minimize  $\int_0^{24} c(t)dt$  where

$$c(t) = \begin{cases} (0.16)x(t) & 0 \leq t \leq 8 \text{ or } 21 \leq t \leq 24 \\ g(x(t)) & 8 \leq t \leq 21 \end{cases}$$

where

$$g(x(t)) = \begin{cases} 0.25x(t) - 0.3 & \text{if } x(t) > 10 \text{ and } 10 \leq t \leq 16 \\ -0.3 & \text{if } x(t) < 10 \text{ and } 10 \leq t \leq 16 \\ 0.25x(t) & \text{otherwise} \end{cases}$$

with the constraint that  $\int_0^{24} x(t)dt = 100$  and additionally that  $x(t) < 20$  for any given  $t$ . This is a reasonable assumption for a given household.

### 1.3 Citation

This is a citation[?].