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Lecture
Lecture questions due Oct 04, 2016 at 19:30 IST

Recitation

Problem Set 4
Homework 4 due Oct 04, 2016 at 19:30 IST

Piecewise Linear Costs Exercise

(1/1 point)

Suppose we have the following piecewise linear function of x

- $y = \frac{2x}{3}$ if $0 \leq x \leq 3$
- $y = 2$ if $3 \leq x \leq 7$

Select the necessary constraints for the formulation

- [x] $w_1 + w_2 = 1$ ✔
- [x] $0 \leq x_1 \leq 3w_1$ ✔
- [x] $y_1 = \frac{2x_1}{3}$ ✔
- [x] $y_2 = 2w_2$ ✔
- [x] $y = y_1 + y_2$ ✔

- [x] $3w_2 \leq x_2 \leq 7w_2$ ✔
- [x] $w_1, w_2 \in \{0, 1\}$ ✔
- [ ] $y_2 \geq 2w_2$
- [ ] $y \geq y_1 + y_2$
- [ ] $0 \leq x_2 \leq 7w_2$
- [ ] $w_1 + w_2 \geq 1$
- [ ] $0 \leq x_1 \leq 7w_1$
- [ ] $y \geq \frac{2x_1}{3}$
- [ ] $y_2 \geq \frac{2w_1}{3} + 2w_2$

✔

SOLUTION

- $w_1 + w_2 = 1$. For the two cases
- $0 \leq x_1 \leq 3w_1$. Here x_1 can be non-zero only if w_1 is non-zero

- $y_1 = \frac{2x_1}{3}$. The first function
- $y_2 = 2w_2$. The second function is non-zero only if w_2 is non-zero
- $y = y_1 + y_2$. Exactly one of the two functions must be non-zero
- $3w_2 \leq x_2 \leq 7w_2$. Here x_2 can be non-zero only if w_2 is non-zero
- $w_1, w_2 \in \{0, 1\}$. Binary variables

You have used 1 of 2 submissions