edX   **MITx: 15.053x Optimization Methods in Business Analytics**

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Lecture
Lecture questions due Oct 11, 2016 at 19:30 IST ✎

Recitation

Problem Set 5
Homework 5 due Oct 11, 2016 at 19:30 IST ✎

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PART A

(1/1 point)
Consider the linear program:

$$\text{max} \quad z = x_1 + 0x_2 \quad (\text{Objective})$$
$$\text{s.t.:}$$
$$-x_1 + x_2 \leq 2 \ (\text{Constraint 1})$$
$$x_1 + x_2 \leq 8 \ (\text{Constraint 2})$$
$$-x_1 + x_2 \geq -4 \ (\text{Constraint 3})$$
$$x_1, x_2 \geq 0 \ (\text{Non-negativity})$$

Solve geometrically and also trace the simplex procedure steps graphically. If the optimal solution is denoted as (x_1, x_2), what is the optimal objective value?

| 6 |

✔

| 6 |

You have used 1 of 3 submissions

PART B

(1/1 point)

Suppose that the objective function is changed to $z = x_1 + cx_2$. Graphically determine the values of c for which the solution found in PART A remains optimal.

○ $-1 \leq c \leq 0$

○ $-2 \leq c \leq 1$

○ $0 \leq c \leq 1$

○ $-1 \leq c \leq 2$

◉ $-1 \leq c \leq 1$ ✔

You have used 1 of 2 submissions

PART C

(1/1 point)

Starting with your graphical solution to PART A, determine the shadow price corresponding to the third constraint. What is the shadow price?

-1/2   ✔

$$-\frac{1}{2}$$

You have used 1 of 3 submissions

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