4578

69+1 (a) set x\_3 = x\_2 + 3, then substitute all x\_2 with x\_3 – 3.

Then, set x\_1 = (x\_1+) - (x\_1-).

Finally,  
Max -(x\_1+) + (x\_1-) + 4x\_3 – 12

-3(x\_1+) + 3(x\_1-) + x\_3 <= 9

(x\_1+) - (x\_1-) + 2x\_3 <= 10

All x >= 0

(b)   
Min 9y\_1 + 10 y\_2 – 12

-3y\_1 + y\_2 >= -1

3y\_1 - y\_2 >= 1

Y\_1 + 2y\_2 >= 4

All y >= 0

(c) 80/7, (x\_1-) = 8/7, x\_3 = 39/7

2 (a) (b) slides

3 (a) Note that only x\_1 is integer. So

P\_0: 215/4 = 53.75, (15/4, 10/3, 0) ,x\_1 non int so we get P\_1 with x\_1 <= 3 and P2 with x\_1 >= 4

P\_1: 50, (3, 23/6, 0) branch ends here.

P\_2: infeasible

so the final answer is 50.

(b)

Min x\_{ij} w\_{ij} where w\_{ij} is the distance between node I to j. x\_{ij} is whether path is taken.

// either node 2 or 3

x\_{12} + x\_{13} = 1

// Now, if go to node 2, either node 4 or 5

// x\_{12} == 1 && (x\_{25} + x{24} = 1)

x\_{24} + x\_{25} = x\_{12}

// similarly for node 3,

x\_{34} + x\_{35} = x\_{13}

// finally, only take 46 if arrived to 4 from either 2 or 3

x\_{46} = x\_{24} + x\_{34}

//similarly

x\_{56} = x\_{25} + x\_{35}

All x in {0,1}

4(a)

R3 dom R1 (rem R1)

C2 dom C1 & C4 (rem C1 & C4)

R3 dom R2 (rem R2)

C2 dom C3 (rem C3)

Best strat is A\_3 B\_2 giving payoff 5

4 (b) basically the coursework. Remember that B’s LP is just the dual of A.