



Solving the Dual Linear Programming Problem Using PROC OPTMODEL (Self-Study)

The problem is recast below in the dual formulation. The dual formulation of the first, two-dimensional, primal simplex problem is solved directly below. (The primal simplex algorithm is used.)

```
proc optmodel;
  /* declare variables */
  var a >= 0, b >= 0, c >= 0;

  /* declare objective */
  min d = 225*a + 117*b + 420*c;

  /* declare constraints */
  con a + b + 3*c >= 12;
  con 3*a + b + 4*c >= 19;

  solve with lp / algorithm=ps;
  print a b c;
  print _con_.dual;

quit;
```

PROC OPTMODEL Output

The OPTMODEL Procedure

Solution Summary

Solver	LP
Algorithm	Primal Simplex
Objective Function	d
Solution Status	Optimal
Objective Value	1782
Primal Infeasibility	0
Dual Infeasibility	0
Bound Infeasibility	0
Iterations	5
Presolve Time	0.00
Solution Time	0.00

a	b	c
3.5	8.5	0

	CON.
[1]	DUAL
1	63
2	54

Notice that the optimized value for the objective function is identical to the objective value in the primal simplex formulation, above. Also notice that values for decision variables that optimize the objective in the dual formulation are identical to the shadow price estimates in the primal formulation.