# Linear Programming Model: Standard Form

Max $Z = 40x_1 + 50x_2 + s_1 + s_2$

subject to: $1x_1 + 2x_2 + s_1 = 40$

$4x_2 + 3x_2 + s_2 = 120$

$x_1, x_2, s_1, s_2 \geq 0$

Where:

$x_1$ = number of bowls

$x_2$ = number of mugs

$s_1, s_2$ are slack variables



**Figure 2.14** Solution Points A, B, and C with Slack

# Linear Programming Vanderbei Solution

**Institute of Management Sciences**

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to problem solving in World War II our founders were physicists mathematicians and engineers who quickly found peace time uses It is fair to say that Operations Research OR was born in the same incubator as computer science and it has spawned many new disciplines such as systems engineering health care management and transportation science Although people from many disciplines routinely use OR methods many scientific researchers engineers and others do not understand basic OR tools and how they can help them Disciplines ranging from finance to bioengineering are the beneficiaries of what we do we take an interdisciplinary approach to problem solving Our strengths are modeling analysis and algorithm design We provide a quanti tive foundation for a broad spectrum of problems from economics to medicine from environmental control to sports from e commerce to computational ometry We are both producers and consumers because the mainstream of OR is in the interfaces As part of this effort to recognize and extend OR roots in future probl solving we organized a set of tutorials designed for people who heard of the topic and want to decide whether to learn it The 90 minutes was spent addre ing the questions What is this about in a nutshell Why is it important Where can I learn more In total we had 14 tutorials and eight of them are published here      Operations Research/Management Science at Work Erhan Kozan,Azuma Ohuchi,2002-03-31 There is synergy between the diverse methodologies ofOperations Research and Management Science and the many problems itseeks to solve Operation Research Management Science at Work isan example of that synergy The principal aim of this book is toexamine selected recent research in and applications of OperationalResearch Management Science The focus is on research that is ofindustry interest and covers a wide range of topics from major fieldsof OR MS in a systematic and coherent fashion Each application ischosen to demonstrate the elegance of their implementations The bookmeets the needs of applied researchers who are interested inapplications of OR MS algorithms Moreover real world problemstogether with their solutions and implementations are the applicationsthat have been selected for the volume The Asia Pacific region has embraced business applications of decisionsupport systems in recent years Many of these applications have thestate of the art OR MS techniques in this region embedded in them Hence the increased use of OR MS techniques in this region providesopportunities for identifying methodological advances that are takingplace as a result of the unique nature of the applications These alsoprovide opportunities for exploring synergies and interfaces thatexist between OR MS both in terms of applications and theoreticaladvances      **Continuous Nonlinear Optimization for Engineering Applications in GAMS Technology** Neculai Andrei,2017-12-04 This book presents the theoretical details and computational performances of algorithms used for solving continuous nonlinear optimization applications imbedded in GAMS Aimed toward scientists and graduate students who utilize optimization methods to model and solve problems in mathematical programming operations research business engineering and industry this book enables readers with a background in nonlinear optimization and linear algebra to use GAMS technology to understand and utilize its important capabilities to optimize algorithms for modeling and solving complex large scale continuous nonlinear optimization problems or applications Beginning with an overview of

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