



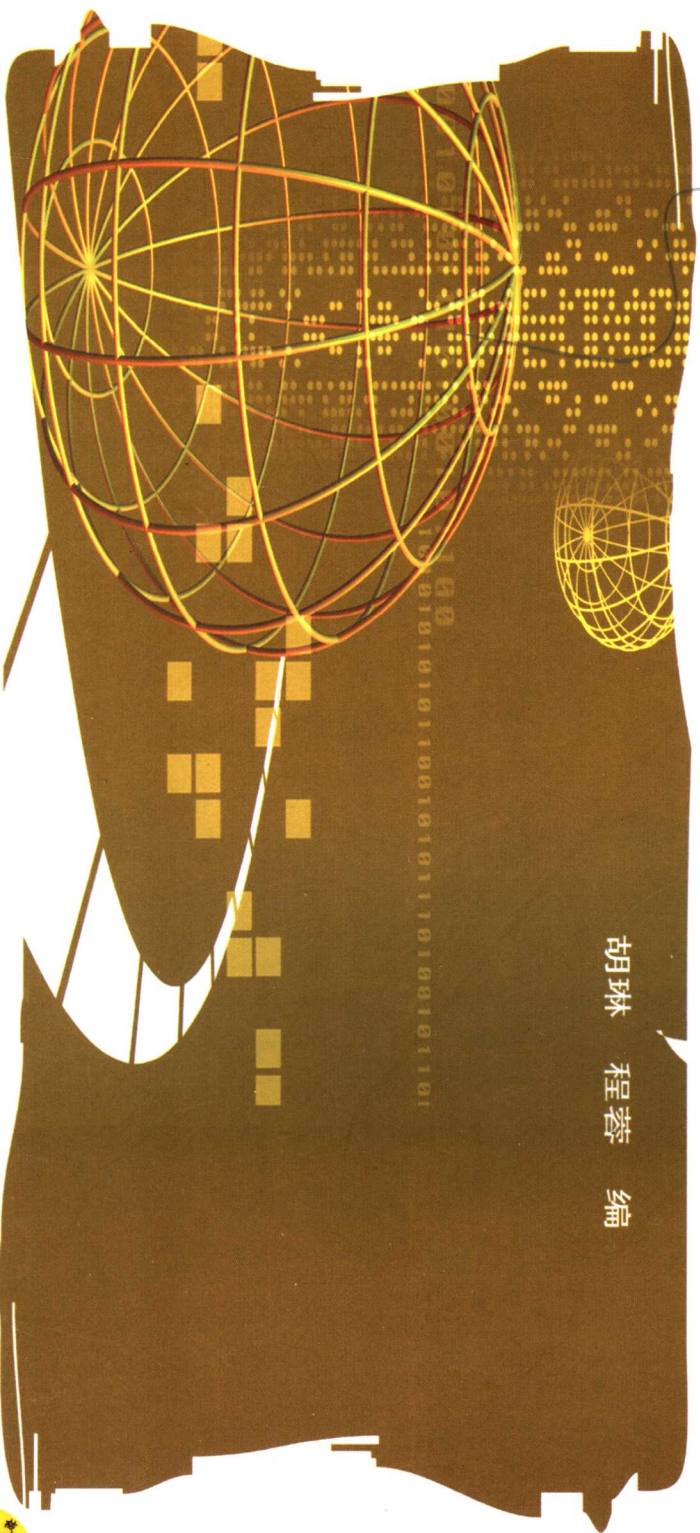
21世纪高校机电类规划教材

工程制图习题集

(英汉双语对照)

EXERCISE WORKBOOK OF ENGINEERING DRAWING

胡琳 程蓉 编



**机械工业出版社**
CHINA MACHINE PRESS



21 世纪高校机

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EXERCISE WORKBOOK OF ENGINEERING DRAWING

(英汉双语对照)

胡 琳 程 蓉 编

陈锦昌 (中文) 马维银 (英文) 主审

机械工业出版社

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本习题集与胡琳主编的《工程制图》(英汉双语对照)教材配套使用。习题集的编排顺序与教材体系一致,采用中英文对照的编排形式。在内容安排上,从工程实际出发,以应用型为主导,加强了徒手绘图和工程实际应用有关部分的练习,使学生通过训练,真正掌握与本课程相关的知识与技能。

本习题集的主要内容包包括:工程制图基本知识、正投影基础、立体及其交线、组合体、轴测图、图样画法、常用机件的表达、零件图、装配图、计算机绘图等。全书采用了最新颁布的国家标准。

本习题集配有CAI练习光盘1张,还配有习题解答和标准答案。

本习题集可作为高等院校理、工、经、管各专业学生工程制图课程(36~64学时)的教材,或作为近机械类专业工程制图(72~108学时)课程的教材,也可作为高职、高专、电大、职大、函授大学、夜大等继续教育相近专业的教材,还可作为从事工程设计与制造的有关技术人员和企业管理人员的自学参考资料。

This workbook is used alongside "Engineering Drawing", edited by Ms. Lin Hu. The layout of this workbook adopts an English-Chinese bilingual layout (the initiation of its kind), the same format as its counterpart textbook. For the presentation of its contents, this workbook introduces application-oriented teaching materials and emphasizes on hand drawings and real engineering examples. This enables students to gain solid knowledge and techniques relevant to the subject.

This workbook involves the basic knowledge of engineering drawing; basic orthographic projection; solids and their intersections; composite parts; axonometric drawings; representation methods; representation for commonly used parts; part drawings; assembly drawings; computer graphics, etc., all of which introduce the latest released national standards.

This workbook has a CAI exercise (CD) and detailed answers to exercises as students' after-class aid or self-learning materials.

This workbook can be used for an Engineering Drawing course (36 to 64 teaching hours) in universities and colleges majoring in various subjects, such as science, engineering, economy and management. It can also be used as a textbook on Engineering Drawing for students whose major is closely related to mechanical engineering (72 to 108 teaching hours), and for students of related subjects in vocational schools, advanced technical schools, broad-based colleges, vocational colleges, correspondence colleges, part-time colleges. It is also a very good reference book for engineering designers, mechanical and manufacturing engineers.

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序

为了适应我国制造业的迅速发展的需要,培养大批素质高、应用能力与实践能力强、应用综合能力强的应用综合型人才已成为当务之急。这同时对高等教育的办学理念、体制、模式、机制和人才培养等方面提出了全新的要求。

为了打通新形势下高等教育和社会需求之间的瓶颈,中国机械工业教育协会机电类学科教学委员会和机械工业出版社联合成立了“21世纪高校机电类规划教材”编审委员会,本着“重基本理论、基本概念,淡化过程推导,突出工程应用”的原则,组织教材编写工作,并力求使本套教材突出以下特点:

(1) 科学定位。本套教材主要面向应用的复合型人才的培养,既不同于培养研究型人才的教材,也不同于一般应用型本科的教材;在保持高学术水准的基础上,突出工程应用,强调创新思维。

(2) 品种齐全。本套教材设有“力学”、“制图”、“设计”、“数控”、“控制”、“实训”、“材料”、“双语”等模块,方便学校选用。

(3) 立体化程度高。教材均要求配备CAI课件和相关的教辅材料,并在网站上为本套教材开设研讨专栏。

机械工业出版社是我国成立最早、规模最大的科技出版社之一,是国家级优秀出版社,是国家高等教育的教材出版基地之一,在机电类教材出版领域具有很高的地位。相信这套教材在中国机械工业教育协会机电类学科委员会和机械工业出版社的精心组织下,通过全国几十所学校的老师的仔细认真的编写,一定能够为我国高等教育应用综合型人才的培养提供更好用、更实用的教材。

教育部·机械工程及自动化专业分教学指导委员会·主任
中国机械工业教育协会·高等学校机械工程及自动化学科教学委员会·主任

李培根 院士
于华中科技大学

Preface

Manufacturing technology is advancing rapidly in our country, so it's imperative to cultivate high-qualified application-oriented talents to meet the upodate needs, which requires the new development in the higher education mode and system.

For filling in the widening gap between social needs and status quo of higher education, the Auditing and Editing Committee for "21 Century Machinery Engineering Teaching Materials in High Schools" is set up by Machinery-electronics Teaching Committee subordinate to China Machinery Education Association and China Machine Press to lay out a series of practical textbooks, based on the principle of "attaching more importance to basic theories and engineering application than the process of concluding."

Features of series are as followed:

- (1) Scientific objective. The series is targeted for training all-round application-oriented talents distinguished from other high-school teaching materials. It has high technicality emphasizes on engineering application and initiative innovation.
 - (2) Selective categories. The series includes mechanics, cartography, design, numerical control, practical training, materials, bilingual teaching, etc. for teachers to choose.
 - (3) Multimedia teaching. Each volume of the series has related courseware and accessorial books and a discussion room on net.
- China Machine Press, one of the early-founded, large-scale publishing houses and high-education textbooks bases, is a prestigious authority in publishing 机电类 books. With concerted efforts from all circles the series of books will contribute greatly to bringing up all-developed high-qualified people for our country.

Director/Chief of Machinery-electronics Teaching Committee, China Machinery Education Association

Peigen Li, Academician

Hua Zhong University of Science and Technology

前 言

当前,我国的高等教育进入了新一轮的改革:大力开展基础课、专业基础课和专业课的双语教学,加速推进我国高等教育的国际化和培养高素质创造性应用型人才。因此,双语教学是我国高等教育与国际接轨,迎接新世纪挑战和发展的必然趋势,也是中国高等教育在 21 世纪必须作出的战略选择。本套工程制图双语教材的编写为双语教学创造了一个良好的条件,及时地满足了高等教育与国际接轨这一教育改革发展的需要。

本习题集是依照高等学校工科制图课程教学指导委员会制订的“画法几何及工程制图课程教学基本要求”,结合近年来工程图学课程改革的特点,立足培养面向 21 世纪的高级工程应用型人才,面向现代制造技术,并紧密围绕以“学”为中心、以“素质提高”为目的的指导思想,力求简明扼要、精选内容编写而成的。本习题集适合于高等院校为理、工、经、管各专业学生开设的“工程制图”课程(36~64 学时)使用,也可用于为近机械类各专业学生开设的“工程制图”(72~108 学时)课程,还可作为继续教育同类专业的教材,以及工程技术人员自学参考资料。

本习题集针对基础课程的特点,继承传统内容的精华,融入编者多年积累的教学经验,着眼于新时期对人才培养的要求,以加强对学生综合素质及创新能力的培养为出发点,力求最大限度地调动学生的学习主动性和积极性,从而使“工程图学”教育从以“知识、技能”为主的综合教育,向以“知识、技能、方法、能力、素质”综合培养的教育转化。本习题集采用了最新颁布的国家标准。为了方便使用,本习题集的编排顺序与教材体系保持一致,并相互配合,使教与学相统一,学与练相促进。

本习题集的主要内容包括:工程制图基本知识、正投影基础、立体及其交线、组合体、轴测图、图画画法、常用机件的表达、零件图、装配图、计算机绘图等。为了使学生更好地完成作业,本习题集配有 CAI 练习光盘 1 张。在练习光盘中,有相应的立体模型动画演示等,便于学生自学或课外辅导,帮助学生掌握学习内容。本书还配有习题解答和标准答案,需要的老师可向本书责任编辑联系、索取。

本习题集由胡琳、程蓉编写。深圳大学 2001 级本科生陈稳娟参加了习题集的有关绘图工作。

本习题集由中国工程图学教学指导委员会副主任委员、广东省工程图学会理事长、华南理工大学的陈锦昌教授和香港城市大学的马维银博士担任主审。二位主审对习题集进行了仔细的审阅,提出了许多宝贵意见和建议,在此表示衷心的感谢!

本习题集参考了国内外有关教材,在此向有关作者深表谢意!并感谢所有关心和帮助本书出版的人员。由于编者水平有限,书中难免存在错误和疏漏,敬请读者批评指正。

Foreword

The higher education in China is now entering a new era of reform which encourages bilingual teaching in foundation courses, technical foundation courses and technical courses. The main objective of the reform is to promote the internationalization of higher education and to cultivate oriented talents with creativity and quality education. The bilingual teaching is thus becoming a trend for our higher education to interface with the world and to face various challenges of the new century. The reform in bilingual teaching is a strategic choice for our higher education in the twenty-first century. The introduction of this book provides a solid base for bilingual teaching and meets the immediate needs of our higher education reform for interfacing with the world.

This workbook was written following the *Basic Requirements in Teaching Descriptive Geometry and Engineering Drawing Course* developed by the Engineering Drawing Advisory Committee for Higher Engineering Education. It is introduced based on the current practices and needs of education reform in teaching engineering drawings. It targets fostering application-oriented talents for the twenty-first century and is guided by advanced manufacturing technologies. It is focused on center learning activities and aims at quality education. The contents of the workbook cover selected topics simplified and extracted for a wide range of readers. The workbook is suited for an Engineering Drawing course (36 to 64 teaching hours) in universities and colleges majoring in various subjects, such as science, engineering, economy and management. It can also be used as a textbook on Engineering Drawing for students whose major is closely related to mechanical engineering (72 to 108 teaching hours), and for continuing education or other equivalent programs. It is also a very good reference book for engineering designers, mechanical and manufacturing engineers.

The workbook was written based on the characteristics of foundation courses. It inherits the essence of a traditional drawing course and integrates extensive teaching experiences of the authors of the past years. It focuses on the education needs of the new era in fostering talents with comprehensive quality education and creative thinking. At the same time, the workbook strives to motivate students' learning at most. As a result, it contributes to important changes for an "Engineering Graphics" course from a kind of "knowledge and technology transferring education" to comprehensive education focusing on knowledge, technology, methodology, capability and quality. This workbook adopts the latest release of national standards and its layout is consistent with its counterpart textbook, which provides uniformity of teaching and learning as well as promoting interactive learning and practicing.

The content of this workbook involves the basic knowledge of engineering drawing; basic orthographic projection; solids and their intersections; composite parts; axonometric drawings; representation methods; representation for commonly used parts; part drawings; assembly drawings; computer graphics, etc.

This workbook has a CAI exercise (CD) as students' after-class aid or self-learning materials, which contains exercise explanations, standard an-

swers, as well as corresponding space model animations. Please contact the responsible editor to come down on related materials with standard answers.

The chief editors of this book are Lin Hu and Rong Cheng. Wenjuan Chen, an undergraduate from Shenzhen University, was also involved in the production of the drawings.

This workbook is audited by Professor Jinchang Chen from Southern China University of Science and Technology and Doctor Weiyin Ma from City University of Hong Kong. Prof. Chen is also the Vice Chairman member of the Engineering Drawing Advisory Committee of the Ministry of Education (China) and Chairman of the Engineering Drawing Society of Guangdong Province. I would like to thank the two auditors for their precious advices.

This workbook was written with reference to some books and teaching materials and their authors are highly appreciated. Thanks also go to many others who helped in the course of the publication of this book.

Due to various limitations, this book may contain mistakes and all critics and corrections from all experts and readers are welcome.

Editor

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1-1 Lettering exercises. 字体练习。

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1 2 3 4 5 6 7 8 9 0

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A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

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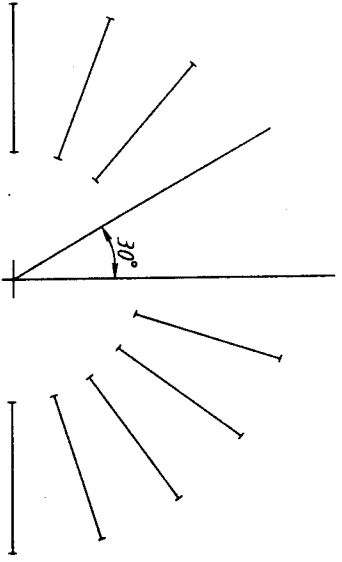
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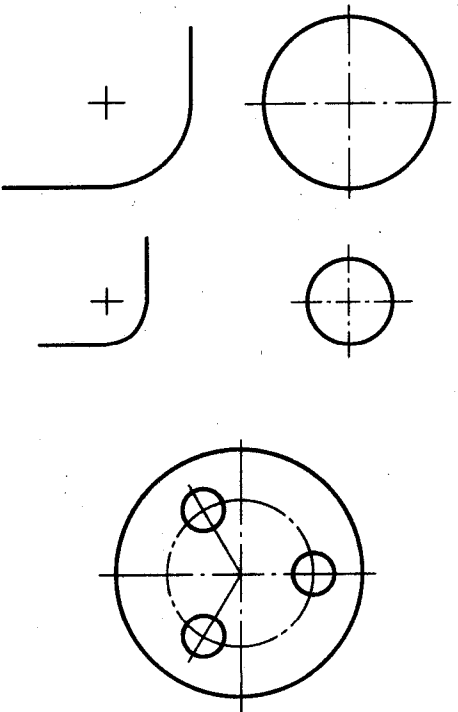
Chapter 1 Basic Knowledge of Drawing (工程制图基本知识)

1-2 Dimensioning exercises (obtain sizes by measuring the drawing and retain the integer). 填注下列图形中的尺寸 (尺寸数值从图中测量, 取整数)。

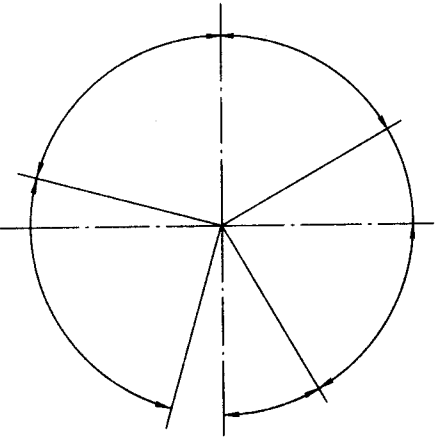
(1) Mark the linear dimension and arrows. 注出线性尺寸和箭头。



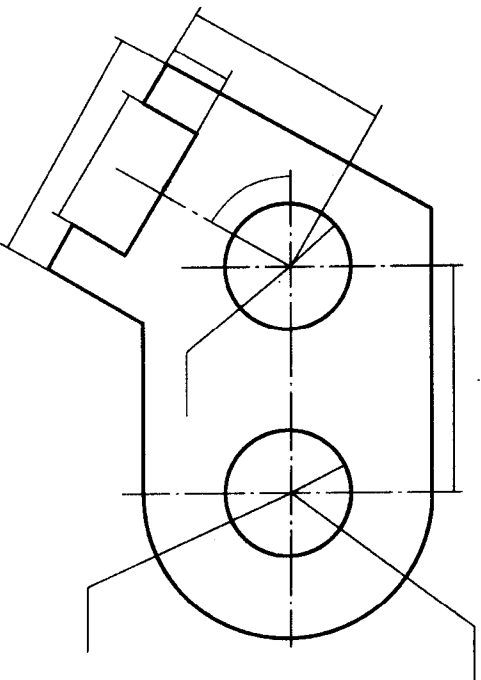
(2) Dimension diameters and radius. 注出圆的直径和半径。



(3) Dimension angles. 注出角度。



(4) Make the dimension and arrows. 注出尺寸和箭头。

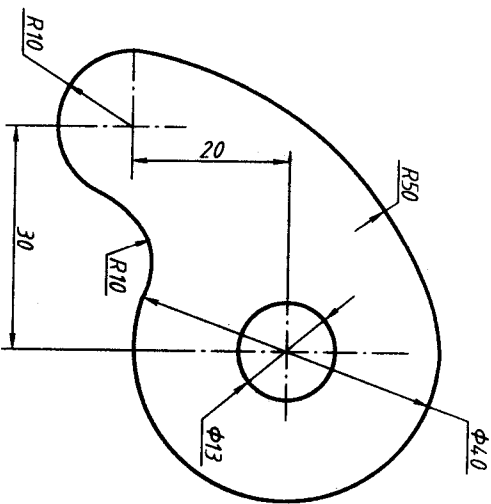


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1-3 Draw the lines with respective line style following the examples. 在指定位置处，照样画出各种图线。

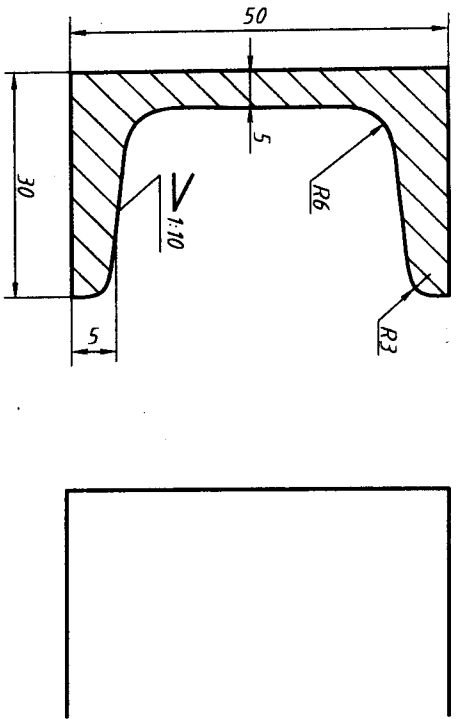
Blank lines for drawing practice, including solid, dashed, and wavy lines.

1-4 Redraw the arcs following the example and dimension (scale 1:1). 按图示尺寸，用 1:1 的比例照样画出平面图形，并标注尺寸。

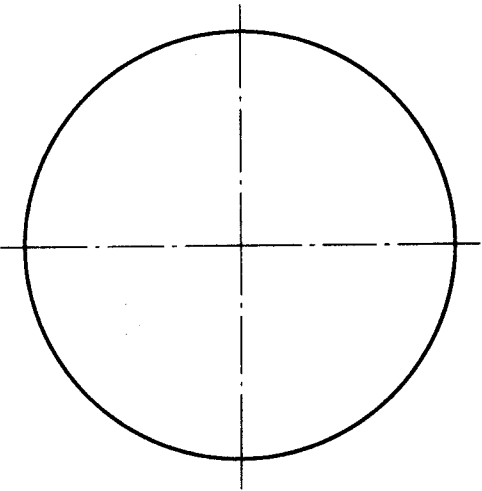


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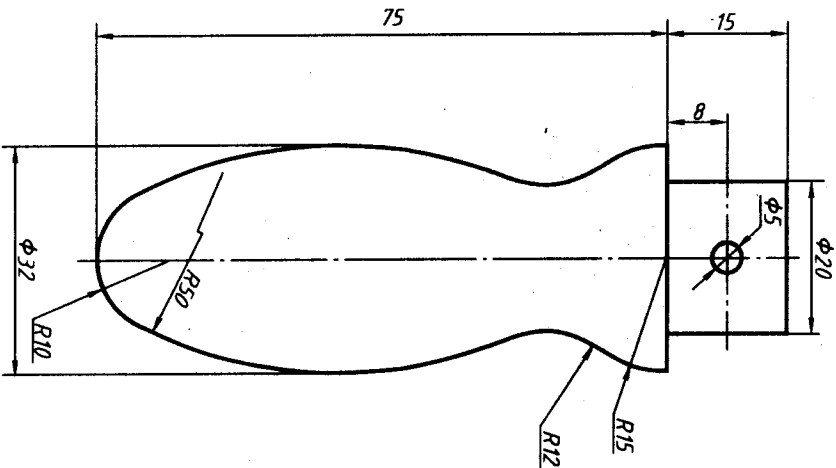
1-5 Add the lines at given slope (scale 1:1). 按规定的斜度补画下列图形中的图线。比例为 1:1。



1-6 Draw a regular heptagon. 作圆的内切正七边形。



1-7 Mark the following drawing on A4 sheet (scale 2:1; continuous thick line 0.8mm; dimension size 3.5). 在 A4 图纸上, 按 2:1 的比例画出下面图形。粗实线宽度为 0.8mm, 尺寸数字为 3.5 号。

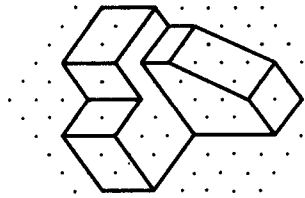


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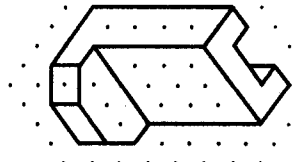
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2-1 Draw the three views of the components on the square grids. 由物体的立体图在给出的方格内画三面投影图。

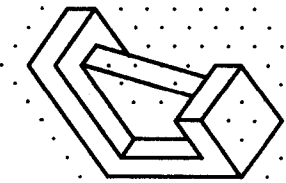
(1)



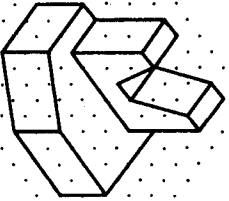
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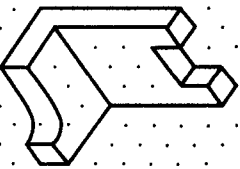
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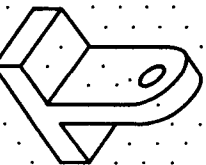
(4)



(5)



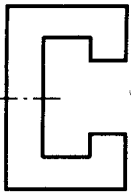

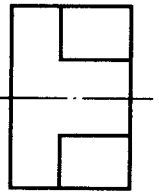
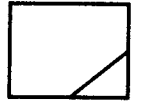
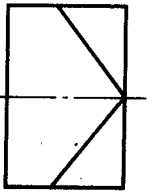

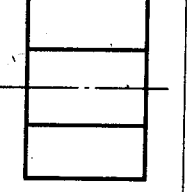


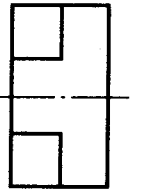
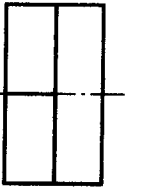
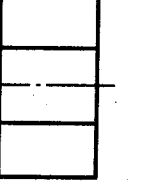
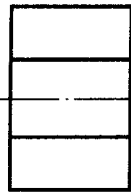

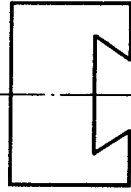

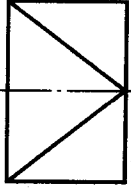
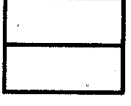
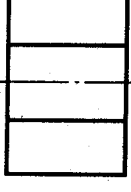
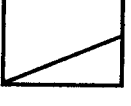
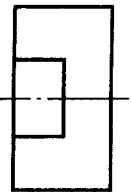

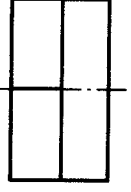
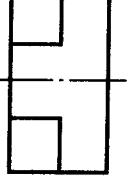
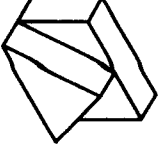
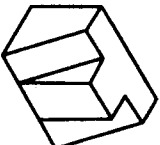
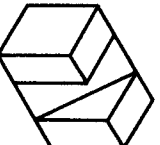
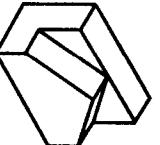
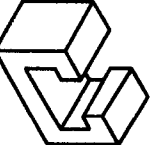
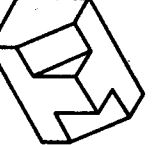
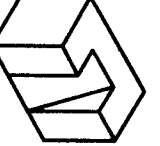
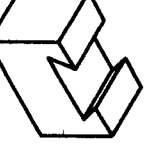
(6)



Class: _____ No: _____

Name: _____

2-2 Place the number of the appropriate three views of the component in the bracket. 在括号内填写对应立体的图号。

							
	()		()		()		()
							
	()		()		()		()
1	2	3	4	5	6	7	8
							

Class: _____ No: _____ Name: _____