

## **A note from the author:**

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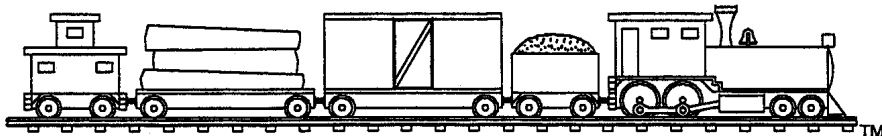
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Melvin G. Peterman



INSIGHT™ TECHNICAL EDUCATION  
PORTLAND, OR

## A brief note of introduction:

This Practical Drafting series is a natural extension of the Complete-A-Sketch™ series. This book will expose the student to many types of drafting and standards. This volume is intended to be an overview of many different applications of drafting. Drafting is the language of engineering. In the engineering field today it is imperative that all participants, drafters, designers, engineers, machinists, electricians, builders, etc. must understand this language. The drawings created are used to assure that a product, part, or building can be built and checked for quality. A drawing is considered a living document and can be revised and updated at any time to adapt to changing needs.

This study is geared to be used by students without outside instruction. The study is built with the intent of helping to promote the use of hand and computer drafting skills. All the lessons in this book may be accomplished both by hand and on the computer. It is my strong recommendation that the student do the lessons by hand using tools of the trade. Then, after being comfortable with manual drafting, complete the lessons on the computer.

## Tools and supplies required:

Small drafting board	Triangle 30° x 60° x 90°	Mechanical pencil, .3mm
T-square	Bow compass with center adjust	Eraser, white for paper
2 Scales, English & Metric	Dividers	Eraser shield
Isometric circle template	Mechanical pencil, .9mm	Drafting tape
Triangle 45° x 45° x 90°	Mechanical pencil, .7mm	8 ½" x 11" paper
Dictionary	Mechanical pencil, .5mm	11" x 17" paper

## Types of CAD Programs:

Start with the simple and inexpensive. Consider the type of computer you own and the amount of money in your budget. There are many products to choose from; they range in price from free (download from the Internet) to several thousands of dollars. Choose one that suits you and learn it. It is my recommendation that you learn one or two programs. If you want to know which CAD programs to focus on, you need to figure out what features are important to you. If you are looking to be in a specific field and you want to prepare yourself for a job or career, look in the help wanted section of the news paper or look at some job web sites like [www.monster.com](http://www.monster.com), [www.boeing.com](http://www.boeing.com), and [www.ceweekly.com](http://www.ceweekly.com); this will tell you the program or programs you want to learn.

## About the author:

In addition to being an author, publisher & business owner, I am a mechanical designer. As it has turned out, I have worked in almost every type of commercial environment imaginable from construction to nuclear to high tech to factories that produce food, extrude plastic, and make shoe parts. I have been working since about 1975 in technical fields. As a youth in 1975, I wanted to help my father and I wanted to do the type of work my father did so I started drawing ductwork systems for him. Since then, I have worked as a mechanical, piping, electrical, and architectural drafter, and as a tooling, machinery, and mechanical designer and patent developer for myself and others. I am proficient in manual and computer drafting, design, and CAD customizing. Additionally, I am proficient in most types of computer software including programming, databases, etc.

## Instructions:

First let me state that you, the owner of this book, may make as many copies of noted pages for personal use as you wish. However, you may not sell, transmit, or give away copies in any form.

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1. Make as many practice copies as you wish of noted pages.
2. Follow the instructions for each lesson.
3. Refer back to previous lessons as required.



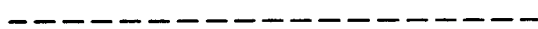






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# LESSON 1.00

## LINES & LETTERING

**NOTE:**  
 LINE WEIGHTS ARE IMPORTANT TO EVERY DRAWING. LINE WEIGHTS HELP THE READER OF THE DRAWING. IT IS AN IMPORTANT PART OF THE DRAFTING LANGUAGE. THIS APPLIES TO BOTH CAD & MANUAL DRAFTING.

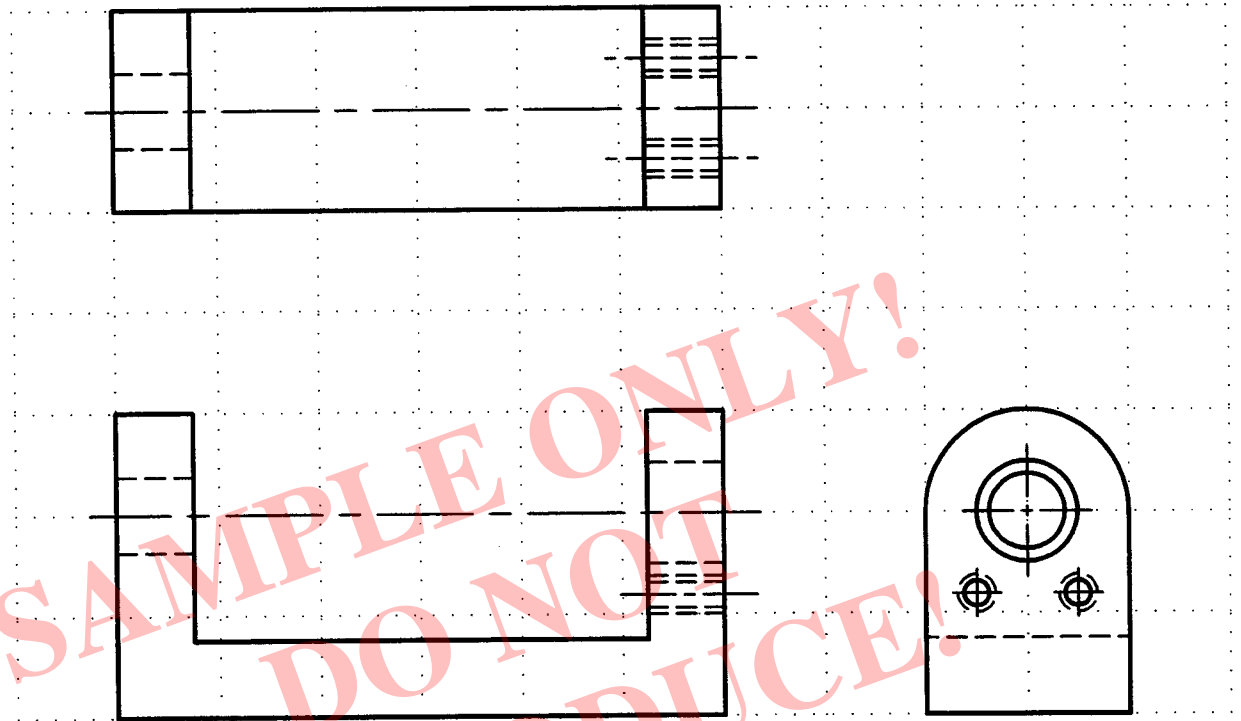
	.3mm, CONSTRUCTION & GUIDELINES, DRAW LIGHTLY
	.9mm OR .7mm, OBJECT LINES
	.5mm, HIDDEN LINES
	.5mm, EXTENSION, DIMENSION, AND LEADER LINES
	.5mm, CENTER LINES
	.3mm, PHANTOM LINES
	.9mm TO 1.8mm MAX., CUTTING PLANE LINES
	.9mm OR .7mm, BREAK LINES
	.3mm, SECTION LINES

**INSTRUCTIONS:**  
 DRAW 4 SETS OF LINES FREE HAND BELOW. USE THE DOTTED LINE IN THE FIRST BOX AS A GUIDE.

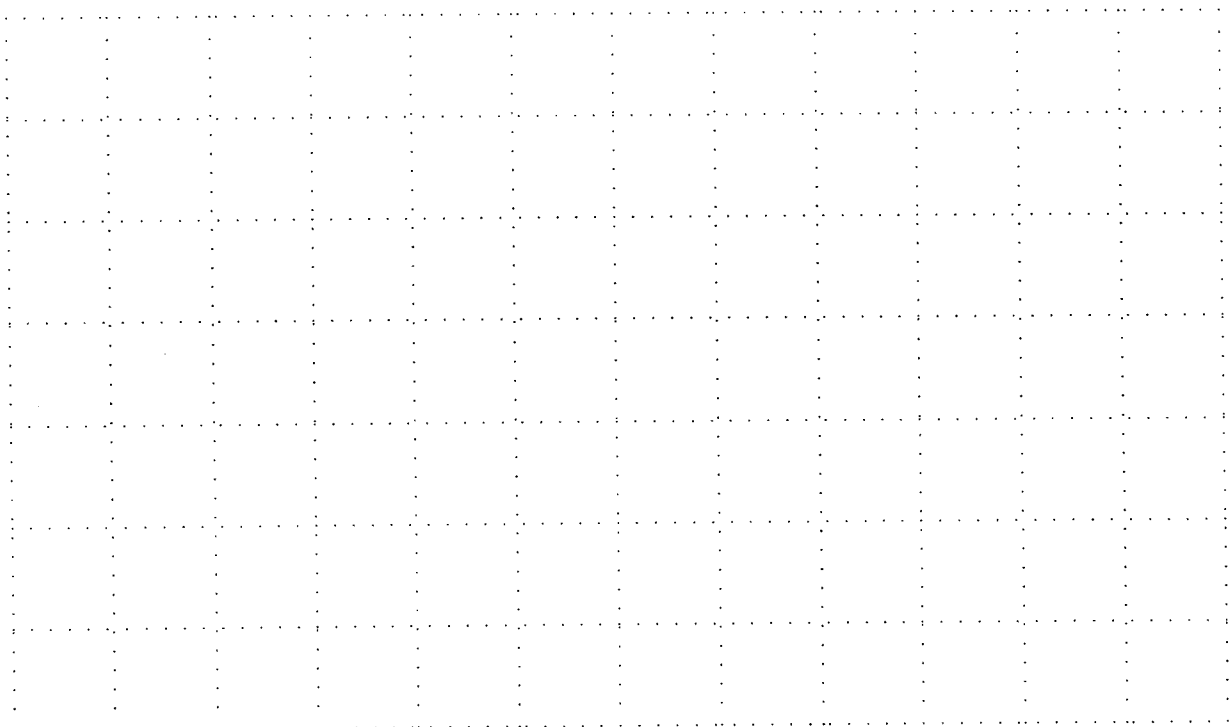
	

# LESSON 1.03

## LINES & LETTERING



INSTRUCTIONS:  
USING THE CORRECT LINE WEIGHTS, DRAW THE THREE FACES OF THE ABOVE OBJECT FREE HAND ON THE GRID BELOW. ENSURE THAT THE THREE VIEWS ARE ALIGNED AND IN THE SAME RELATIVE LOCATION.

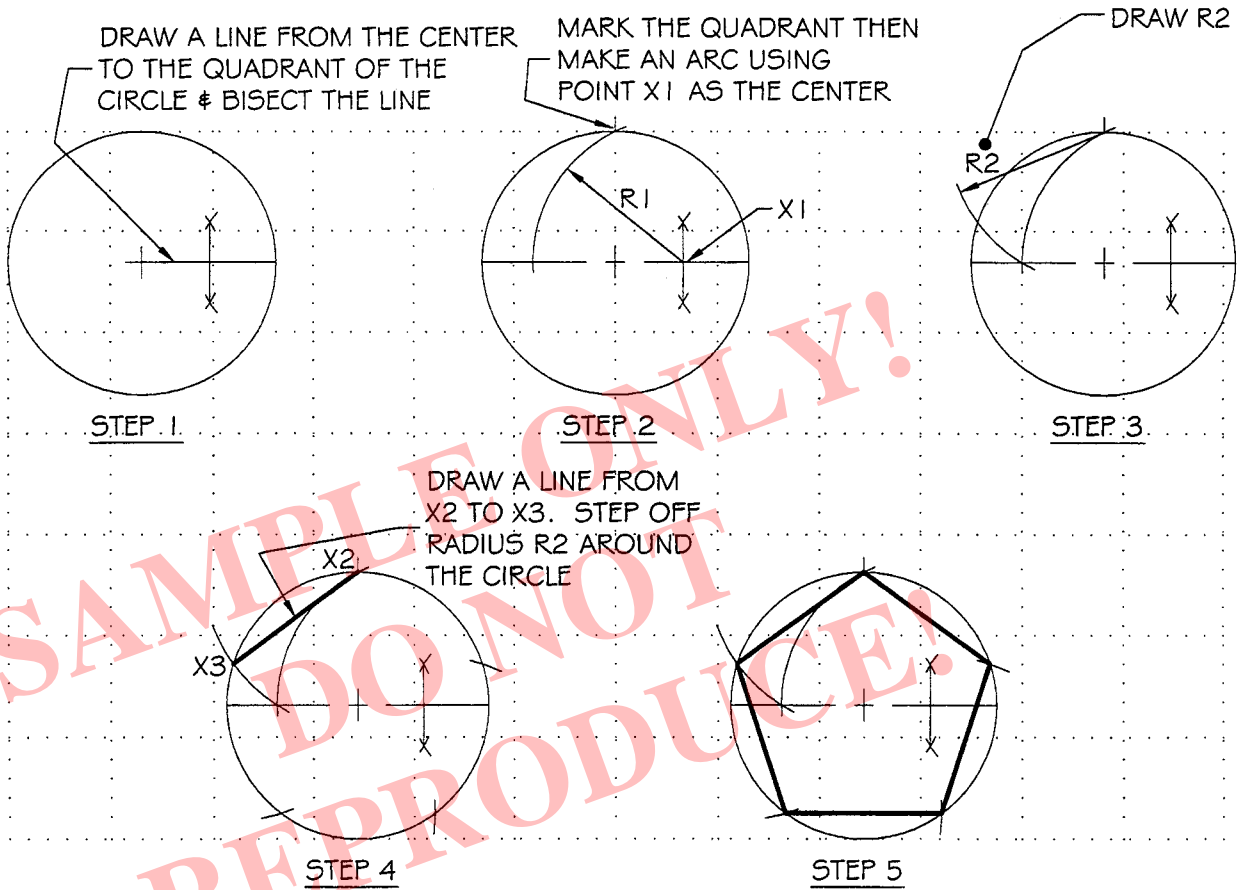




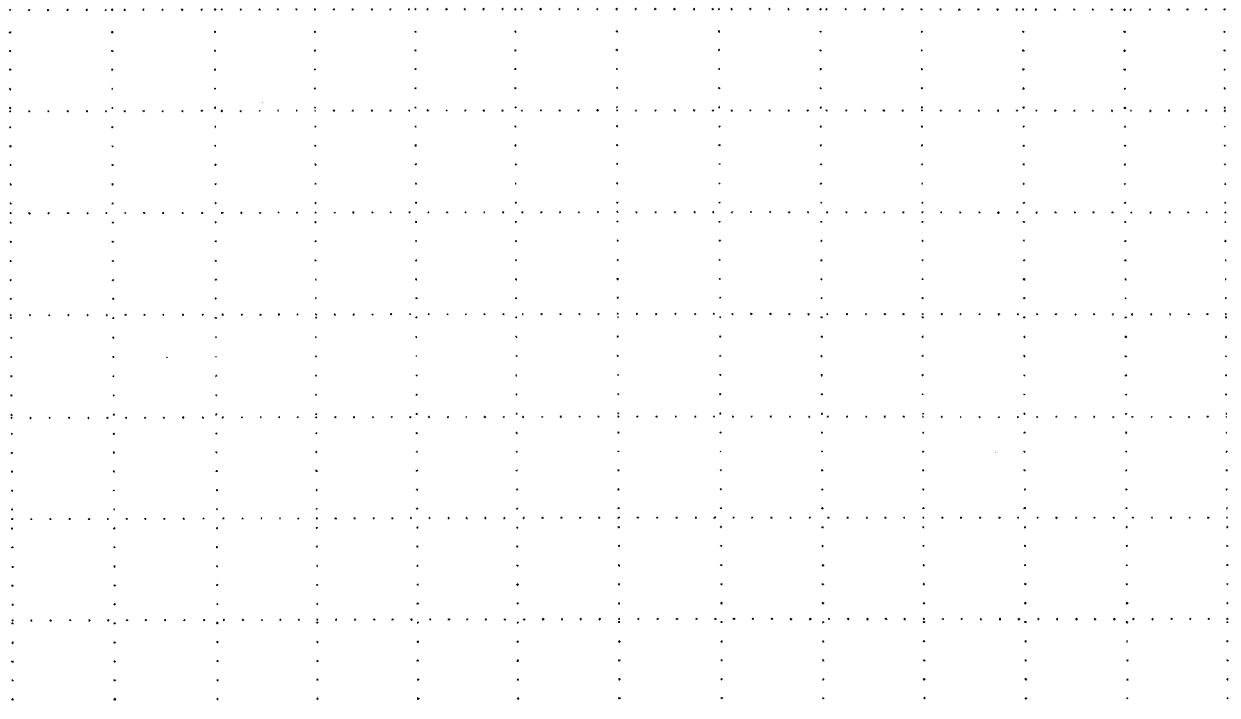
# LESSON 3.15

## GEOMETRIC SHAPES & CONSTRUCTIONS

NOTE:  
INSCRIBING A PENTAGON ABOUT A CIRCLE.



INSTRUCTIONS:  
USING TOOLS OR CAD, REPRODUCE THE ABOVE RESULTS OF THE EXERCISE.  
CAD COMMANDS TO CONSIDER: POLYGON, ARRAY





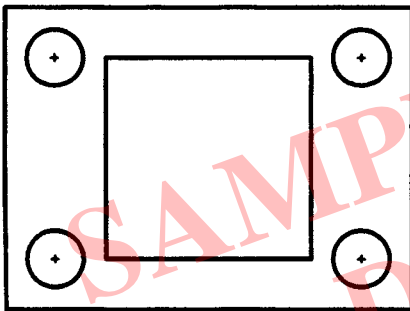
# LESSON 4.09

## SKETCHING -- MULTIVIEW

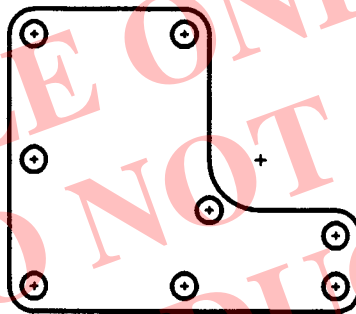
NOTE: THE NUMBER OF VIEWS REQUIRED FOR A PART IS DICTATED BY THE PART & THE ORGANIZATION IT IS BEING PRODUCED FOR. THERE ARE MANY APPLICATIONS WHERE A SINGLE VIEW IS PERFECTLY ADEQUATE. OTHER PARTS WILL REQUIRE MORE VIEWS. DRAW ONLY WHAT IS NEEDED & NO MORE. THIS IS PRODUCTION WORK. IN THE EVENT THE WORK IS BEING DONE IN A 3D MODELING PACKAGE, THE PART WILL BE COMPLETE. HOWEVER, THE ACTUAL 2D REPRESENTATION OF THE PARTS SHOULD BE KEPT TO A MINIMUM. MORE WORK EQUALS MORE TIME WHICH EQUALS MORE MONEY. KEEP IT SIMPLE.

NOTE: WHEN DRAFTING IN 3 VIEWS IT IS COMMON FOR DIFFERENT LINE TYPES TO END UP IN THE SAME LOCATION. THAT IS, IF YOU WERE TO DRAW THE LINES, THEY WOULD BE STACKED OR BEHIND EACH OTHER. VISIBLE LINES TAKE PRECEDENCE, THEN HIDDEN, THEN CENTER LINES.

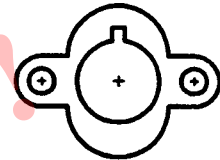
INSTRUCTIONS: ON A BLANK PIECE OF PAPER, REPRODUCE THE FOLLOWING ITEMS BY SKETCHING. NO SCALE IS REQUIRED.



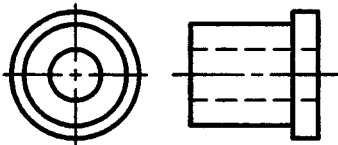
PROBLEM 1  
SINGLE VIEW



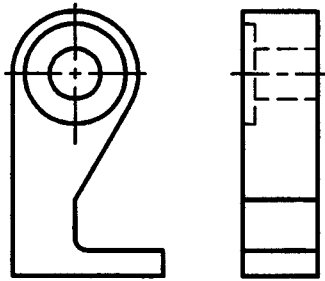
PROBLEM 2  
SINGLE VIEW



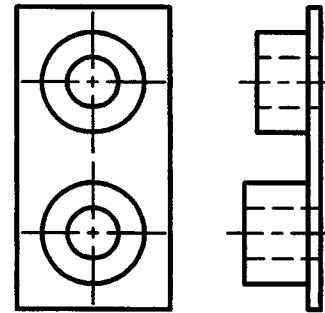
PROBLEM 3  
SINGLE VIEW



PROBLEM 4  
TWO VIEW



PROBLEM 5  
TWO VIEW



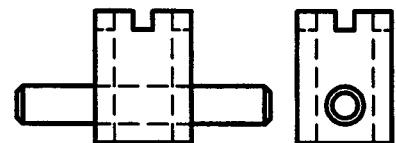
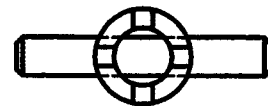
PROBLEM 6  
TWO VIEW



PROBLEM 7  
THREE VIEW



PROBLEM 8  
THREE VIEW



PROBLEM 9  
THREE VIEW