

# SOLUTIONS MANUAL




12th Edition

## Technical Drawing



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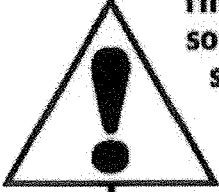
**Online Instructor's Manual**  
*to accompany*

# **Technical Drawing** **13<sup>th</sup> Edition**

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ANSWER KEY  
to questions at the end of the Chapters

1. When is sketching used as graphic communication?

In Problem identification, Stage 1, sketching may be used to clarify the understanding of the problem.

In Concepts and Ideas, Stage 2, sketching may be used to clarify a possible solution to a problem. All sketches should be dated and signed. In Compromise Solutions, Stage 3, sketches are used to analyze preliminary design with design layout.

2. Why are standards so important for members of the engineering design team?

It is intended to provide engineers, builders, industry, and science a method of uniform graphic communication. Drafting standards are designated ANSI Y14 standards.

3. What is the design process?

The organized and orderly approach to solving problems.

4. What are the five stages of the design process?

1 - Identification of the customer and the problem.

2 - Generate Concepts and ideas.

3 - Compromise Solutions.

4 - Models and Prototypes.

5 - Production or Working Drawings.

5. Describe the difference between concurrent and traditional design process models.

Traditional design and manufacturing activities have taken place in sequential order.

Concurrent design activities are accomplished simultaneously, to shorten the time and cost of product life cycle.

6. What does PDM or EDM stand for? What are some advantages of PDM?

PDM – Product data management

EDM – enterprise data management

An effective PDM system allows all of the product data to be quickly stored, retrieved, displayed, printed, managed, and transferred to anywhere in the organization.

7. When are rapid prototypes useful?

Most often during the Models and Prototypes phase of the design process. In the Concurrent design process, this can happen at almost anytime.

1. Draw the alphabet of lines and label each line.

The instructor should evaluate the alphabet of lines.

Lines that are drawn thick include **Visible** lines and **Cutting plane** lines. Lines drawn thin are **Hidden** lines, **Dimension** lines, **Extension** lines, **Centerlines**, and **Phantom** lines.

**Construction** lines and **Guide** lines are drawn very light so they are not reproduced when copied.

2. Which Architect's scale represents a size of 1:24? Which metric scale represents a half size? Which engineering scale would be used for full size?

$\frac{1}{2}$ " scale

1:2 scale

10 scale

3. Which scale type is the only one to use fractions of an inch?

Architect scale

4. What are the main advantages of polyester film as a drawing media?

Its transparency, and printing qualities are good. It provides an excellent matte drawing surface for pencil or ink. It is easy to erase without leaving ghost marks, and has high dimensional stability. It is very durable resisting cracking, bending, and tearing.

5. What are the four standard types of projections?

Multiview, Axonometric, Oblique, and Perspective

6. Which drawing lines are thick? Which are thin? Which are very light and should not be reproduced when copied?

Thick lines – visible lines, cutting-plane lines, viewing plane lines, short break lines, & chain lines.

Thin lines – hidden lines, section lines, center lines, symmetry lines, dimension lines, leaders, long-break lines, phantom lines, & stitch lines.

Very light lines – guide lines and construction lines

7. What font provides the shape of standard engineering lettering?

Gothic single-stroke sans-serif

8. Describe the characteristics of good freehand lettering.

Knowing the proportions and forms of the letters

Spacing of letters and words for legibility

Practice

8. List three ways that a CAD database can be used.

**SUGGESTED RESPONSES**

- a. Sharing design information with all players in the design and manufacturing process.
- b. Share design ideas and modifications with design and manufacturing team members.
- c. Members of the design team can quickly see the effects of design and manufacturing changes and provide timely responses.

9. List five techniques you can use to enhance creativity.

**SUGGESTED RESPONSES**

- a. Reverse engineering
- b. Functional decomposition
- c. Ask "how the product can be improved?"
- d. Ask "how the product can be made more effective?"
- e. Ask "how can the product life be increase?"