Visualization
Chapter 1

Spatial Ability

Spatial Ability

The ability to visualize and make mental pictures of your creative ideas is one of the most important skills an engineer can possess. You need to be able to form mental pictures of your ideas and make technical sketches or computer-aided design and drafting (CADD) drawings from them so your ideas can be made real. You also should be able to look at technical drawings, interpret them and be able to visualize what three-dimensional objects the drawings represent so you can understand different designs and ideas. Some people are better at visualization than others, but everyone can learn to visualize and improve his or her spatial abilities.

Sketching can help you record your initial ideas on paper, and practicing sketching can develop your spatial abilities. Leonardo da Vinci is famous for the many sketches he made of his ideas. Once you have developed your ideas with sketches, you can go a step further and create computer models and technical drawings of them. You can even test your designs on the computer before building them. Later in the book you will be visualizing some of your own creative ideas and making sketches of them.

Exercise

There are many types of technical drawings that engineers and other designers use to represent their ideas. Based on what you see around you and what you have learned so far, answer the following questions about whether you think technical drawings were necessary to create the given object. Use the available lines to explain your answers.
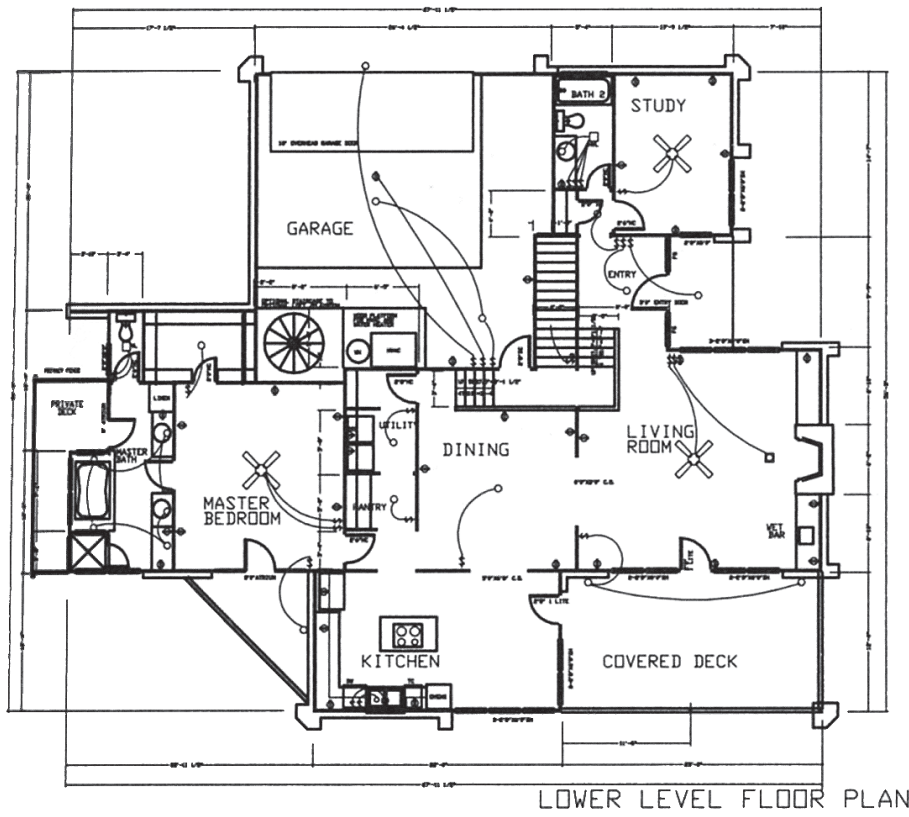
1. The computer you are using   Yes   No

_____

_____

_____

_____

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2. A mechanical pencil   Yes   No

_____

_____

_____

_____

3. The building you are in   Yes   No

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LOWER LEVEL FLOOR PLAN

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4. The clothing you are wearing   Yes   No

_____

_____

_____

_____

_____

_____

5. Your textbooks   Yes   No

_____

_____

_____

These examples are just a few of the ways that visualization and technical graphics are an important part of the field of engineering. In the following chapters you will encounter more specific examples that are used in the different fields of engineering, from sketches, charts, and graphs to interactive 3D models and simulations.