Getting Students Involved in the Learning Process
by Joanne S. Lockwood

We’ve all had students come to us with a question about a math problem and say to us, “I understood it when you did it on the board.” And we have all said to our classes something along the lines of “You can’t learn to play the piano by watching someone else play.” Students must do mathematics in order to learn it. The trick is figuring out how to get our students involved in the learning process.

Of course, first of all our students have to actually do some problems. Ideally, as each concept in a course is presented, students work through, on their own, a related exercise. It is important that at this stage they think about what to do at each step in the solution, not simply watch someone else work through it. Exploring Introductory and Intermediate Algebra: A Graphing Approach uses an interactive approach that provides students with the opportunity to do just that. Each section of the text contains one or more sets of matched-pair Example/You Try It problems. The numbered example in each set is worked out and serves as a model for the student. The second example, the You Try It, is for the student to work. By solving this problem, the student actively practices concepts as they are presented. Complete worked-out solutions to the You Try It problems are provided in an appendix. Students can compare their solutions to the solution in the appendix and thereby obtain immediate feedback on, and reinforcement of, the concept.

You Try It 1
The boiling point of water at sea level is 100°C. The boiling point decreases 3.5°C for each 1-kilometer increase in altitude. Find a linear function that gives the boiling point of water as a function of altitude.

Solution  See page 514. \( f(x) = -3.5x + 100 \), where \( f(x) \) is the boiling point of water \( x \) kilometers above sea level.

Find Equations of Lines Using the Point-Slope Formula
For each of the previous examples, the known point on the graph of the linear function was the \( y \)-intercept. This information enabled us to determine \( b \) for the linear function \( f(x) = mx + b \). In some instances, a point other than the \( y \)-intercept is given. In this case, the point-slope formula is used to find the equation of the line.

Point-Slope Formula of a Straight Line
Let \( P_1(x_1, y_1) \) be a point on a line, and let \( m \) be the slope of the line. Then the equation of the line can be found using the point-slope formula

\[ y - y_1 = m(x - x_1) \]

While presenting a lesson in class, we ask our students questions in order to determine their understanding of the concepts we are introducing. This same approach is used throughout Exploring Introductory and Intermediate Algebra. At various places in the exposition, we ask the student to respond to a question about the material being read. This question encourages the student to pause, think about the current discussion, and answer the question. The student can then check that answer against the one provided at the bottom of the page. The Question/Answer below is from Section 2.3, The Properties of Functions.
This approach of asking students to respond to questions is taken a step further in the exercise sets. At the beginning of each exercise set are questions entitled "Topics for Discussion," which ask students to discuss or write about a concept presented in the section. These questions are more challenging than those posed in the Question/Answer feature. For example, here is one from the chapter on Linear Functions:

Suppose a biologist determined that there is a linear model that relates the height of a tree, \( y \), to its age, \( x \). In the equation \( y = mx + b \), would you expect \( m \) to be positive or negative? Why?

A fourth interactive component, which accompanies the text, is SMARTTHINKING™, a live, online tutoring service. The emphasis here is on "thinking." Rather than giving students answers, trained tutors guide students through the learning process. And that is our goal – learning.

**Features for Student Involvement**

If you are interested in engaging your students in the learning process, check out the features described above in Exploring Introductory and Intermediate Algebra: A Graphing Approach. The pages referenced are from Section 3.1, Solving First-Degree Equations.

- Example/You Try It exercises, pages 165, 166-167, 167, 168-169, 170
- Question/Answer feature, page 164
- Topics for Discussion, page 171

To get your students involved on the first day of class, see the interactive nature of the student preface, Aim for Success, on page xxv.

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