Effective Math Tutoring

Adapted from Lower Columbia College's Tutor Training Handbook, George Dennis, Supervisor.

THE FIVE-STEP METHOD

Step one:
Always look at the problem in the book. Never trust that a student has set it up correctly.

Step two:
Ask student to explain the procedure s/he is using to solve the problem. You can troubleshoot and listen for erroneous logic or incorrect procedures at that time. Don't accept the answer "I don't have any idea." Prompt for anything the student does know and build on that.

Step three:
Reinforce any correct procedures (e.g. "This part is done correctly", or "You are on target here".) Then identify incorrect logic and ask the student to consider what else s/he might try. You can provide a hint, but avoid explanations until after the student has attempted a guess. (e.g. "When you evaluate an integral, what do you evaluate first, the upper or lower part?")

Step four:
To check for understanding, have the student re-explain the procedure to you. Avoid asking questions Yes/No questions like, "Does that make sense to you?" and "Do you understand now?" Instead ask specific questions like "Why did we just do that? What comes next?"

Step five:
Disengage!
Encourage the student to work the next problem on his/her own, but let him/her know you will check back. Do not get drawn into working the next problem with an insecure student. S/he needs to develop the ability to apply what s/he is learning without your supervision.

Five Tips for Math Tutors

1. **Be a Guide.** A math tutor should guide a student through the solution process, not just show how it's done. Ask the student leading questions that will direct him or her to discover the correct steps.

   Avoid doing problems for the student.

   If the student cannot get the correct answer and asks for help, look at what the he or she has done and try to locate the error. Then have the student work a similar problem to make sure he/she has grasped the concept or procedure.

2. **Discuss Concepts.** The goal of tutoring is learning: not just to help solve the problem, but to help students become independent learners. In mathematics, it is important to discuss concepts rather than just processes or procedures. For example, the tutor should explain why it is important to follow the "order of operations" rule, PEMDAS, rather than just showing the student how to do it. Understanding the concepts makes it easier to remember the procedures and learn new material.

3. **Encourage Students to Attend Class.** Some students believe getting help from a tutor is a substitute for attending class. Students having difficulty in math must realize time spent with a tutor is additional to classroom time. Ask what was covered in class, and have the student show you class notes.

4. **Address Math Anxiety.** You may will deal with students with varying degrees of math anxiety. Avoid using phrases such as, "this is easy." Such phrases may intimidate the student. Instead, say “I know you can learn this, it’s just going to take some practice.” If the student suffers from a high degree of math anxiety it may be helpful to refer the student to a counselor. Learn about the student's math background, challenges and especially successes. Focus on when the student has been motivated and learned well, and build on that.

5. **Don't Confuse the Student**. If you are unsure of a mathematical procedure or concept, check with someone—another tutor, a math instructor. Find out what approach the text or instructor is using on a particular problem, since it may be different from how you learned it. Using the same technique as the text or instructor will reinforce a familiar concept or procedure, whereas using a different approach may confuse the student.