Preface to Instructors for Integrated Review

In an effort to increase completion rates at community colleges, four-year colleges, and universities, there has been a push to change the traditional mathematics course sequence for students who place into developmental mathematics courses. The traditional developmental mathematics course sequence has been a gatekeeper for many to achieve a college degree. One solution to eliminate the barrier to collegiate mathematics is the co-requisite class, in which students are exposed to material typically taught in prerequisite courses (such as Intermediate Algebra) on a just-in-time basis in the corresponding college level course.

Statistics: Informed Decisions Using Data with Integrated Review is a solution for a co-requisite statistics course. We carefully considered content presented in traditional developmental mathematics courses and developed a learning path for presenting material that students will need to be successful in Statistics. We also wrote new material that represents content that is normally not covered in a traditional developmental sequence, but would be of benefit to students. Of particular importance in selecting and writing material was to develop the mathematical thinking and maturity that comes with successful completion of a developmental mathematics curriculum. Therefore, this course includes material on study skills as well as developing mathematical skills, mathematical thinking, and statistical thinking. The material in the *Integrated Review* is available as a print component and also in the *Integrated Review* course in MyStatLab.

The logic behind developing material was to expose students to the mathematics they will need prior to working on the corresponding statistics material. As an example, Chapter 1 of Statistics is heavy on data collection and the language of statistics. There is not a lot of "number crunching". While students work on Chapter 1 of Statistics, the corresponding co-requisite material is meant to develop the skills students will need to be successful in Chapter 2 of Statistics. Below is a summary of the organization.

- While studying Chapter 1 of Statistics, work on the Chapter 1 co-requisite material to get ready for Chapter 2 of Statistics.
- While studying Chapter 2 of Statistics, work on the Chapter 2 co-requisite material to get ready for Chapter 3 of Statistics.
- And so on . . .

It is important to understand that the material written for the co-requisite portion of the course is based on the Sullivan Developmental Mathematics series. Therefore, the writing style and pedagogy are consistent with that found in the Sullivan Statistics text. In addition, the material has been well-vetted by the marketplace.

The Learning Path

We expect that some (if not many) students will already have mastery of some objectives covered within a given co-requisite module. It is frustrating for students to work through homework problems on content they already understand. To address this scenario, we have developed chapter-level and section-level quizzes that students may take prior to working on a particular module. This allows two pathways through the Integrated Review module.

- **Step 1—Chapter Level Skills Check** Each Integrated Review module begins with a chapter-level quiz. Any student who scores a certain level of mastery on the quiz (such as 80%) is considered to have mastery of the material within the chapter and is allowed to proceed to the next chapter.

- **Step 2—Section Level Skills Check** If a student does not demonstrate mastery on the chapter-level quiz, then the student must take section-level quizzes to assess the student's proficiency of content within the section. If the student scores a certain level of mastery on the quiz (such as 80%), then the student may move to the next section. If the student scores less than the prescribed level of mastery, a personalized homework is created that allows the student to remediate on those objectives that are not mastered. See the sources for remediation below. Once the personalized homework is complete at a certain level of mastery (we recommend 90%), the student may retake the quiz to demonstrate mastery (or the cycle repeats). Once mastery is attained, the student moves on to the next section's quiz.

As with any MyMathLab/MyStatLab course, the instructor has complete autonomy over the structure of the course and may choose to adapt the options provided above or develop a learning path from scratch.

Remediation

The co-requisite course offers a variety of remediation tools for the student. The two that students are most likely to use are the objective-level videos and the text. As mentioned earlier, the co-requisite material is based on the Sullivan Developmental Mathematics series.

- **Video** The videos that students may use for remediation were created by the Developmental Mathematics author team with many of the videos done by Michael Sullivan. The videos are created at the objective level so that students will not waste time watching video on material they have demonstrated mastery on. Each video includes a complete development of the topic along with one or more examples illustrating the mathematics. When the amount of material within a particular objective warrants it, more than one video per objective may be available. This is done to keep video length down to a manageable level. Students will be alerted to the availability of a video with the ▶ icon. The videos are available in MyStatLab and are captioned in English and Spanish. The videos are also available through a Quick Response (QR) code ▦ located in the section ribbon opener in the text.

- **Text** Each section of the co-requisite material is based on material originally written for the Developmental Mathematics series. The text presents explanations, definition, examples, and homework problems for the student. In addition, the answers to all Quick Check exercises and odd numbered end-of-section exercises are available to the student.

The Structure of the Integrated Review Text

Students who enroll in a co-requisite class likely have hectic lives coupled with anxiety and trepidation as it pertains to quantitative disciplines. Therefore, any text must provide pedagogical support that makes the text and supplements valuable to students as they study and do assignments. Pedagogy must be presented within a framework that teaches students how to study mathematics and statistics.

Integrated Review has a set of pedagogical features that help students develop good study skills, garner an understanding of the connections between topics, and work smarter in the process. The pedagogy is based upon the more than 25 years of classroom teaching experience the author brings to this text.

Examples are often the determining factor in how valuable a textbook is to a student. Students look to examples to provide them with guidance and instruction when they need it most—the times when they are away from the instructor and the classroom. *Integrated Review* has several example formats in an attempt to provide superior guidance and instruction for students. The formats include:

Innovative Examples

Examples have a two-column format in which annotations are provided to the **left** of the arithmetic or algebra, rather than the right, as is the practice in most text.

Because we read from **left to right**, placing the annotation on the left will make more sense to the student. It becomes clear that the annotation describes what we are about to do instead of what was just done. The annotations may be thought of as the teacher's voice offering guidance and clarification immediately before writing the next step in the solution on the board. Consider the following:

▶ **EXAMPLE 3** **Solving a Linear Equation by Combining Like Terms**

Solve the linear equation: $3y - 2 + 5y = 2y + 5 + 4y + 3$

Solution

$$3y - 2 + 5y = 2y + 5 + 4y + 3$$

Combine like terms: $\qquad 8y - 2 = 6y + 8$

Subtract 6y from both sides: $\qquad 8y - 2 - 6y = 6y + 8 - 6y$

$$2y - 2 = 8$$

Add 2 to both sides: $\qquad 2y - 2 + 2 = 8 + 2$

$$2y = 10$$

Divide both sides by 2: $\qquad \dfrac{2y}{2} = \dfrac{10}{2}$

$$y = 5$$

Check $\qquad 3y - 2 + 5y = 2y + 5 + 4y + 3$

Let $y = 5$ in the original equation: $\quad 3(5) - 2 + 5(5) \overset{?}{=} 2(5) + 5 + 4(5) + 3$

$$15 - 2 + 25 \overset{?}{=} 10 + 5 + 20 + 3$$

$$38 = 38 \quad \text{True}$$

The solution set is $\{5\}$. ●

> **Quick** ✔
>
> *In Problems 11–13, solve each linear equation and verify your solution.*
>
> **11.** $2x + 3 + 5x + 1 = 4x + 10$
>
> **12.** $4b + 3 - b - 8 - 5b = 2b - 1 - b - 1$
>
> **13.** $2w + 8 - 7w + 1 = 3w - 1 + 2w - 5$

Showcase Examples

Showcase Examples are used strategically to introduce key topics or important problem-solving techniques. These examples provide "how-to" instruction by offering a guided, step-by-step approach to solving a problem. Students can then immediately see how each of the steps is employed. All showcase examples have the words "How to" in the example title and have a three-column format in which the column on the left describes a step, the middle column provides an annotation (in red) to explain the step, and the right column presents the arithmetic/algebra. With this format, students can see each step in the problem-solving process in context so that the steps make more sense.

> **EXAMPLE 7** **How to Round a Decimal**

Round 0.387 to the nearest hundredth.

Step-by-Step Solution

Step 1: Identify and underline the digit you want to round to.

We wish to round to the nearest hundredth: 0.3<u>8</u>7

Step 2: If the digit to the right of the underlined digit is a 5 or more, add 1 to the underlined digit. If the digit to the right of the underlined digit is 4 or less, leave the underlined digit as is.

The digit to the right of 8 is 7. Because 7 is greater than 5, add 1 to 8: $1 + 8 = 9$

Step 3: Drop the digits to the right of the underlined digit.

0.387 rounded to the nearest hundredth is 0.39. ●

Quick Check Exercises

Placed at the conclusion of most examples, the *Quick Check* exercises provide students with an opportunity for immediate reinforcement. By working the problems that mirror the example just presented, students get instant feedback and gain confidence in their understanding of the concept. All *Quick Check* exercises are available in MyStatLab. In addition, if the student selects View the Textbook in the Learning Aids he/she will be directed to the portion of the text that illustrates the concepts being assessed in the Quick Check exercise. Finally, all *Quick Check* exercise answers are provided with the Student Answers.