THE QUANTITATIVE SKILLS PROGRAM

The Quantitative Skills Program at Bowdoin College was established in 1996 to assist with the integration of quantitative reasoning throughout the curriculum and to aid students in their pursuit of the skills needed to “go beyond routine problem solving to handle problem situations of greater complexity and diversity, and to connect ideas and procedures more readily with other topics both within and outside mathematics.”

The Quantitative Skills (Q-Skills) Program is part of The Center for Learning and Teaching located in Kanbar Hall. The Q-Skills Program works with first-year students in a variety of ways, including:

- Assessing students’ quantitative skill levels
- Advising students about appropriate quantitative courses
- Providing workshops, peer-led study groups, and individual tutoring to support quantitative courses

---

1 quoted from the Mathematical Association of America guidelines

The College Distribution Requirements include one course on Mathematical, Computational, or Statistical Reasoning. These courses enable students to use mathematics and quantitative models and techniques to understand the world around them. Completing either a course that exposes the student to the general tools of mathematics and statistics or a course that applies these tools in a subject area will fulfill this requirement. These courses will emphasize at least three of the following intellectual skills:

- Interpretation of mathematical, computational, and statistical constructs such as formulas, graphs, tables, and schematics, and drawing inferences from them;
- Representation of information graphically, numerically, or mathematically
- Use of mathematical, algorithmic, or statistical methods to model and analyze real word problems;
- Solve mathematical or computational problems.

The Q-Skills Program’s assessment, advising, and course support systems are available to all students as they fulfill this requirement and other quantitative courses.

For more details about the Q-Skills Program please visit the program web site at [http://academic.bowdoin.edu/qskills/faq.shtml](http://academic.bowdoin.edu/qskills/faq.shtml)

The Quantitative Skills Test is a primary component of the assessment of a student’s entering quantitative skill level. The test, administered during Orientation, covers topics such as computation and estimation, basic probability and statistics, graphical analysis and common functions, and logical reasoning. The test is given in various classrooms on campus, and takes about an hour to complete. Basic arithmetic calculators are provided.
for the test. **Students who may need alternate testing conditions should make arrangements by contacting Joann Canning in the Office of the Dean of Student Affairs prior to arriving on campus for Orientation.**

The Director of Quantitative Skills, Linda Kirstein, analyzes the test results and shares the scores with advisors. The test results, in addition to other indicators, are used by the Director to advise individual students regarding possible course options and also to determine appropriate support activities for courses and students.

A few **Sample Problems** are provided below so that entering students will have some familiarity with the nature of the questions and the format of the test. We encourage you to work on these problems in a situation similar to what you will encounter on campus.

**Suggestions:**

- Print a copy of the test and circle the answers you select.
- Work on the problems using only pencil and paper (and if you utilize a calculator, use it only for basic arithmetic purposes). Do not consult any texts, notes or people while doing your practice test.
- Complete the 10 problems in one 15-20 minute session
- Look at the answer key only after you have completed the entire sample set

Scoring 70% or above on these sample problems is an indication that you may be prepared to do equally well on the on-campus test. If you desire additional review, it is recommended that you consult with your high school faculty, sharing with them the types of problems and requesting additional practice exercises.

**Ten Sample Problems**

You may want to simulate the testing situation by working from a paper copy of the problems below. See also the suggestions above.

1. The town of Brunswick consumed 4,000 barrels of oil in 1995. Brunswick’s oil consumption is predicted to increase at a rate of 10% per year. According to this prediction, by what percent will Brunswick’s oil consumption increase from 1995 to 1997?
   a. 10%  b. 20%  c. 21%  d. 25%  e. 26%

2. The star Alpha Centauri is $2.53 \times 10^{13}$ miles from Earth. There are $3.154 \times 10^7$ seconds per year and light travels at the rate of $1.86 \times 10^5$ miles per second. Estimate (do not calculate exactly) how long it takes light to reach Earth from Alpha Centauri.
   a. 3 years  b. 4 years  c. 5 years  d. 8 years  e. 42 years
3. What conclusion(s) can be logically deduced from the following premises about children?
   Children younger than 9 months old do not run.
   Children fall down only when they are learning to walk or when they are running.
   Abel is a child who fell down.
   a. Abel is younger than 9 months old.       b. Abel was learning to walk.
   c. Abel was running.       d. None of these       e. All of these

4. Cystic Fibrosis (CF) is an inherited disease that occurs when a child inherits a defective gene from each parent. If one gene is defective and one is normal, the person develops no symptoms and is called a “carrier.” If the person inherits two normal genes, the person is “clear.” If both genes are defective, the child develops CF. Suppose that each of the parent’s two genes are equally likely to be passed on to the child and that two known carriers have a child. The probability that the child develops CF is
   a. .04       b. .25       c. .4       d. .5       e. .75

5. Tuition, room, board, activity and health fees, books, and personal expenses are expected to total to about $28,000 for entering students at a particular private college. Room rent is about 9.4% or the total expenses. About how much should a student at this college expect to pay for room rent?
   a. $263       b. $2520       c. $2630       d. $25,200       e. $26,320

6. If you add 9 liters of distilled water to 1 liter of a salt solution with concentration of 100 grams per liter, then the concentration of the resulting solution is
   a. 9 g/l       b. 10 g/l       c. 11 g/l       d. 90 g/l       e. 100 g/l

7. A chef preparing a banquet needs to serve 120 kg of cooked meat. How many kilograms of meat will the cook need to prepare if the meat loses a quarter of its weight while cooking?
   a. 30 kg       b. 90 kg       c. 150 kg       d. 160 kg       e. 480 kg
8. A student decides to purchase a used car that is 40 months old and has a value of $8825. Five months later the value dropped to $8240. The Blue Book value on this model car indicated that it was worth $9995 at 30 months of age. Below is a graph showing this information.

![Graph showing car value by month](image)

The slope in the graph above represents

- a. $ value of the car for a particular age in months
- b. $ value of the car for a 1 month period
- c. Increase in $ value of the car for a 1 month period
- d. Decrease in $ value of the car for a 1 month period
- e. None of the above

9. The following represents the hours slept by 7 college students one night:
   
   6, 7, 13, 9, 7, 6, 8

   Let m be the median and x be the mean of the data. Find the value of m – x
   
   a. –1  
   b. -.5  
   c. 0  
   d. 1  
   e. 2.5
10. The histogram below shows the gasoline production in the U.S. from 1950 (year 1) to 1980 (year 4). (One unit is one million barrels.)

What was the gasoline production growth rate from 1950 to 1980?

a. 45 units    b. 135 units/decade    c. 235 units/decade
   d. 337.5 units/decade    e. 450 units/decade

Answers are below; it is recommended that you look at them only after you have completed the entire test.

Answers