PUMaC Conventions

- All Individual Test answers are integers.
- Some Individual Test questions may ask you to concatenate the numerator and denominator of a fraction to produce an integer answer. For instance, if your answer is 101/1746, you should submit the integer 1011746 as your answer.
- The words “compute,” “find,” or “evaluate” always call for an answer in simplest form, according to the usual mathematical consensus. (For instance, 9/6, 4 + 3, and 4sin(30°) are unacceptable; 3/4, 11, and sin(17°) are acceptable.) Justification is not necessary. When there’s no mathematical consensus about which of several answers is “most simplified,” any of them will be accepted: for example, 3/2, 1 1/2, and 1.5 are all acceptable.
- When a question calls for an “ordered pair (a, b),” the answer must be given precisely in that form, including the parentheses and the comma. The same applies for other ordered n-tuples.
- When a polygon is named by letters, the letters are vertices occurring in their given order around the polygon. (For example, a polygon named ABCDE is understood as a pentagon with vertices A, B, C, D, and E occurring in that order.) Unless otherwise specified, all polygons are non-degenerate (no angles of 0 or π) and non-self-intersecting, but not necessarily convex.
- Written numbers and logarithms are base 10 unless indicated otherwise by a subscript. The use of log(x) also implies that x is positive. For example, log₃ 81 = 4. Exception: ln(x) refers to logₑ(x).
- The letter i is used for complex numbers, where i² = -1.
- Divisors (or factors) of an integer refer to positive integer divisors only. Proper divisors of an integer are divisors other than the integer itself.
- Prime numbers refers to positive primes only.
- Some problems refer to the digits of a number. In these cases the digits are usually underlined. For instance, in the question “Find the missing digits A and B if k = A 2 5 B and k is a multiple of 72” (k = 1000A + 200 + 50 + B where A is an integer between 1 and 9 and B is an integer between 0 and 9, and k is not (necessarily) the product of A, 2, 5, and B).
- Diagrams are not necessarily drawn to scale.
- The greatest lower bound of a set is the largest number which is less than or equal to all elements of the set. Thus 2 is the greatest lower bound for both \{x : 2 < x\} and \{x : 2 ≤ x\}. Similarly, 3 is the least upper bound for both \{x : x < 3\} and \{x : x ≤ 3\}.
- The open interval bounded by real numbers a and b, a < b, is written (a, b), and the closed interval bounded by a and b, a ≤ b, is written [a, b]. Semi-open/semi-closed intervals are written (a, b] or [a, b).
- The sum of all the elements of the empty set is 0. Likewise, the product of all the elements of the empty set is 1.
- When a fraction is said to be written as \(\frac{m}{n}\) in “simplest form,” this means that m and n are relatively prime positive integers.