SOME REFERENCES ON PROBLEM-SOLVING

version of October 1999 (incomplete)

- G. L. Alexanderson, L. F. Klosinski, and L. C. Larson, *The William Lowell Putnam Mathematical Competition, Problems and Solutions: 1965–1984*, Mathematical Association of America, 1985. All Putnam problems for the period 1965–1984, with rather brief solutions (which were originally published in the *American Mathematical Monthly*).

- E. J. Barbeau, M. S. Klamkin, and W. O. J. Moser, *Five Hundred Mathematical Challenges*, Mathematical Association of America, 1995. Mathematics is at the high school level, but many problems will still be challenging to undergraduates.

- G. T. Gilbert, M. Krusemeyer, and L. C. Larson, *The Wohascum County Problem Book*, Mathematical Association of America, 1993.

- A. M. Gleason, R. E. Greenwood, and L. M. Kelly, *The William Lowell Putnam Mathematical Competition*, Mathematical Association of America, 1980. Consists of solutions to all Putnam problems during the period 1938–1964. Very good exposition with lots of motivation, connections with more general areas, etc.

- S. L. Greitzer, *International Mathematical Olympiads, 1959–1977*, Mathematical Association of America, 1978.

- P. Halmos, *Problems for Mathematicians, Young and Old*, Mathematical Association of America, 1991. I haven't seen this, but it should be quite entertaining.

- R. Honsberger, *Mathematical Morsels*, Mathematical Association of America, 1978. Contains 91 problems (with solutions) obtained from various mathematics journals and requiring nothing beyond freshman mathematics to solve.

- R. Honsberger, *More Mathematical Morsels*, Mathematical Association of America, 1991. Similar in format to *Mathematical Morsels*, with 57 problems and somewhat more discussion of each problem. Most of the problems are taken from the journal *Crux Mathematicorum.*

- R. Honsberger, *Mathematical Gems*, *Mathematical Gems II*, and *Mathematical Gems III*, Mathematical Association of America, 1973, 1976, 1985. Not really problem books but rather collections of mathematical essays on topics of interest to problem-solvers. However, many interesting problems are discussed.

- R. Honsberger, *From Erdős to Kiev: Problems of Olympiad Caliber*, Mathematical Association of America, 1995.

- G. Klambauer, *Problems and Propositions in Analysis*, Marcel Dekker, New York, 1979. Several hundred problems and solutions in the four areas (a) arithmetic and combinatorics, (b) inequalities, (c) sequences and series, and (d) real functions. Difficulty ranges from easy to absurd. Includes some famous classical problems which are "well-known" but for which comprehensible complete solutions were impossible to find.

- M. S. Klamkin, *USA Mathematical Olympiads 1972–1986, Problems and Solutions*, Mathematical Association of America, 1988.

- M. S. Klamkin, *International Mathematical Olympiads; and Forty Supplementary Problems, 1978–1985*, Mathematical Association of America, 1986.

- J. D. E. Konhauser, D. Velleman, and S. Wagon, *Which Way Did the Bicycle Go?*, Mathematical Association of America, 1996. 191 challenging problems with solutions.

- J. Kürchak, *Hungarian Problem Book II (Eőtvős Competitions)*, Mathematical Association of America, 1963.

- L. Larson, *Problem solving through problems*, Springer-Verlag, New York, 1983.

- D. J. Newman, *A Problem Seminar*, Springer-Verlag, New York, 1982. A wonderful collection of elegant and ingenious problems, arranged by subject. Each problem comes with a hint and a solution.

- G. Pólya and G. Szegö, *Problems and Theorems in Analysis*, volumes I and II, Springer-Verlag, New York, 1976. An English translation of a famous German classic. Develops the equivalent of a graduate level course in classical analysis (real and complex) based on problem solving. While many of the problems are too sophisticated for contests such as the Putnam Exam, there are still a large number of more accessible problems covering material almost impossible to learn otherwise.

- S. Rabinowitz, ed., *Index to Mathematical Problems 1980–1984*, MathPro Press, Westford, MA, 1992. A huge collection of over 5000 problems from the problem columns of dozens of mathematics journals. No solutions.

- D. O. Shkliarskii, *The USSR olympiad problem book*, Freeman, San Francisco, 1962.

- R. Vakil, *A Mathematical Mosaic: Patterns and Problem Solving*, Mathematical Association of America, 1997.