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The Constant hunters

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There are now several comprehensive programs that, given a floating point number such as 6.518670730718491, can return concise non-float constants such as $3\arctan 2 + \ln 9 + 1$ that closely approximate the float. Surprisingly often such a result is the exact limit that is approached as the float is computed with increasing precision. Therefore these program results are candidates for proving an exact result that you could not otherwise compute or conjecture without the program. Moreover, candidates that are *not* the exact limit can be provable bounds, or convey qualitative insight, or suggest series that they truncate, or provide sufficiently close efficient approximations for subsequent computation.

1. Some such programs can be used freely online. For example:
   - **Inverse Symbolic Calculator** by Simon Plouffe, Jon and Peter Borwein, *et al*,
   - **Wolfram|Alpha**,
   - **On-line Encyclopedia of Integer Sequences** by Neil Sloane and Simon Plouffe.
2. Other such programs are *functions* built into a computer algebra system. For example:
   - the Maple **identify** function adapted by Kevin Hare from Alan Meichsner's M.S. thesis,
   - the **identify** and **findpoly** functions in MPMath, hence also SymPy and Sage.
3. Other such programs are freely downloadable. For example:
   - **Plouffe's inverter** Maple program,
   - the Java **MESearch** program developed by Jon Zurutuza Salsamendi,
   - the C **ries** program developed by Robert Munafo,
   - the *Mathematica* **AskConstants** program developed by me.

The presentation will demonstrate some of these programs and describe their varied underlying algorithms. Almost everyone who uses or should use mathematical software can benefit from acquaintance with several such programs, because these programs differ in the types of constants that they can return.