TickCalc

This provides most of the numeric, trigonometric and hyperbolic functions, and there are 3 financial functions also. This uses the numbers at top for the calculations, which are performed sequentially. You can enter numbers by pressing the keyboard number keys, the numeric keypad number keys (if you have a numeric keypad), or by clicking the buttons for each number directly on the screen with the mouse (though this is slower of course).

There are sufficient controls to ensure only valid numbers are entered, eg you will only be able to enter one decimal point. The numbers are displayed in decimal notation only, ie not scientific notation (1.2E+10). The number of decimal places for display of the results can set by the popup menu at the bottom. The right upper popup menu determines whether circular functions use degrees or radians. I use extended reals in all non-integer calculations (10 bytes) so can claim accuracy to 16+ significant figures.

Clicking the Record… check box at the bottom of the calculator will append each calculator action and results to the NoteBook window.

Operation

•To perform a calculation, enter a number, and click a function key (eg the √x̄ key). If an answer can be computed instantly, then the display will be updated. If another number is required (eg with the +, -, X, ÷ or any operation with an "r" constant in its name) enter the next number, then press either "enter" or the "=" key to perform the operation.

•Consecutive operations can be performed with the displayed number used consecutively in the subsequent operation (including subtraction).

•To reiterate, the operations with an "r" in their name will require at least 2 operands before a result can be calculated.

•Several operations will only work with integers, eg x! (factorials), nCr (number of combinations possible) and nPr (number of permutations possible), with an error if real numbers are used as operands. There are limits to the numbers which can be used in these calculations, and if you overdo it, the display will inform you that you have overflowed.

•MR, CM, M+ refer to the memory display which will store one number when M+ is clicked, clears the memory (CM) or recalls the number in memory (MR) respectively.

•C will clear the display.

•π and e can be activated from the keyboard by pressing the "p" or "e" keys respectively.

•The circular trigonometric functions will regard the displayed number as being in degrees or radians depending upon what the pop-up button at the top right of the calculator displays.

•The calculator can be left behind other windows on the desktop until needed, and reactivated by clicking on it or selecting its name in the menu.

Financial Functions

•The financial functions are selected by the lower right pop up menu. There is little that can go wrong with these, but I have put in what I consider reasonable limits to avoid overflows & crashes.

•The abbreviations are: PV present value, FV future value, PMT payment per period.

•Note that the rate is not a percentage (ie 10% is a rate of 0.1).

•Method: key in the number then click the appropriate button, eg for compound interest on $100, rate 8% pa, over 3 years, you would type 100 and click PV, 0.08 and click rate, 3 and click periods, and then FV to get the answer ($125.97 approx).

•All computations used in getting the solutions are a single step except determining the rate when the other 3 are known. The rate algorithm solves a transcendental equation by iteration (and hence takes longer than all other computations). It will be accurate to the set number of decimal places, so if you want a rough answer only, make sure you reset the Decimal Places pop up menu before clicking the rate button.

•No calculations will begin until you have entered in 3 of the 4 valid parameters for each of these calculations. Once they are entered, you can alter further ones and then click any other to see the effect, ie TickCalc remembers the prior values.

•If you hit the clear button C then you will clear the financial registers too.

•The Amortize button will bring up a dialog allowing you to set a starting loan balance (assumed to be paid off to zero), a specified number of years to pay it off, a specified number of periods per each year (usually 12 months), and an interest rate (not percentage) per year. Clicking the Calc PMT (Calculate payment) button will present both the necessary payment for such a loan and the effective rate per payment period. You can then elect to print the whole table out in a NoteBook window by clicking the Table button. You will then need to bring forward the NoteBook window. Note that 1 tab only will be placed between columns, allowing you to cut and paste this table into other applications (including

spreadsheets) where theywill align more accurately in columns.

Conversion button
The conversions currently supported are for programmers. The dialog allows the things I found most difficult to do, convert dates to seconds using the Mac's system (secs since 1/1/1904) and vice versa. It also provides a series of editable fields for conversion of 4 bytes into some common but different formats (long integers, hex, octal, binary, ASCII and real). The fields will only allow their correct key entries so (hopefully) experimenting won't crash anything... (joke!).

Constants
Distance:
    1 cm = 0.394 in = 0.0328 feet
    1 m = 39.37 inches = 1.093 yds
    1 km = 0.621 mile <=>   1 mile = 1.609 km
    1 in = 2.54 cm = 1/12 foot
    1 yd = 0.914 m = 36.00 inches
    1 rod = 16.5 feet = 5.5 yds
    1 furlong = 660 feet   <=> 1 mile = 320 rods = 5280 feet
    1 hand = 4 inches <=> 1 fathom = 6 feet
    1 knot = 6086 feet <=> 1 nautical mile
    1 sq foot = 144 sq inches <=> 1 sq yd = 9 sq feet
    1 sq rod = 30.25 sq yds <=> 1acre = 160 sq rods
    1 sq mile = 640 acres (1 acre is 208.71 ft each side)
Weight:
    1 gm = 0.035274 oz = 0.002205 lbs
    1 kg = 35.274 oz = 2.205 lbs
    1 oz = 28.35 gm = 1/16 lb
    1 bushel = 4 pecks   <=> 1 cord = 128 cubic feet
    1 oz = 16 drams <=> 1 lb = 16 oz <=> 1 hundredweight (cwt) = 100 lbs
    1 ton = 2000 lbs <=> 1 long ton = 2240 lbs
    1 pennyweight (dwt) = 24 grains <=> 1oz = 20 cwt (Troy)
Volume:
    1 litre = 2.113 pints = 1.057 quarts = 0.264 gallons
    1 pint = 0.473 litre = 473 ml = 1/2 quart = 1/8 gallon
    1 pint = 4 gills <=> 1 barrel = 31.5 gallons = 1/2 hogshead (!)
    1 fl oz = 28.4 ml   1 ml = 0.0352 fl oz
    1 acre foot = 1230 m^3 <=> 1000 m^3 = 0.811 acre foot
    1 cubic foot = 1728 cubic inches <=> 1 cubic yd = 27 cubic feet
    1 cord of wood = 128 cubic feet <=> 1 perch of stone = 24.75 cubic ft
Force:
    1 lbf = 4.45 N   <=> 1 N = 0.225 lbf
    1 tonf = 9.96 kN   <=> 1 kN = 0.100 tonf
Pressure:
    1 psi = 6.89 kPa   <=> 1 kPa = 0.145 psi
    1 atm = 101 kPa   <=> 1 MPa = 9.87 atm
    1 ton/in^2 = 15.4 MPa   <=> 1 MPa = 0.0647 ton/in^2
    1 in Hg = 33.9 mb   <=> 1 mb = 0.0295 in Hg
     (NB 1 mb = 100 Pa)
    Atmospheric pressure at sea level = 14.7 lbs/in^2
Velocity:
    1 mph = 1.61 km/h   <=> 1 km/h = 0.621 mph
    1 knot = 1.85 km/h
Temperature:
    1 °C = 5/9 (°F -32)   <=> 1 °F = 9 x °C/5 + 32
Energy:
    1 Btu = 1.06 kJ   <=> 1 kJ = 0.948 Btu
    1 therm = 106 MJ   <=> 1 MJ = 9480 therm
    1 kWh = 3.60 MJ
Power:
    1 hp = 0.746 kW   <=> 1 kW = 1.34 hp
Angular velocity:

1 rpm = 0.105 rad/s   <=> 1 rad/s = 9.55 rpm
1 meridian (of earth) = 69.16 miles at equator
Paper (British measures):
1 quire = 24 sheets <=>   1 ream = 20 quires   <=> 1 bale = 10 reams
Numerics:
Golden Mean = ø = ($\sqrt{5}$ - 1)/2 ≈ 0.61803398