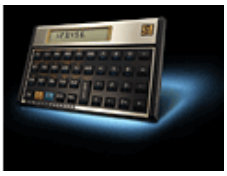
# HP Solve
Calculating solutions powered by HP



## Tax time is here and HP can help

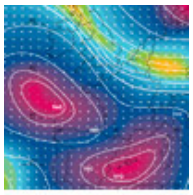
HP financial calculators can help you get the right answers quickly and easily.

Learn more »

## Your articles

» **Be a CIO Hero!**
Get the recognition you deserve, let HP is help you become a CIO hero.

» **The best selling Real Estate HP 10bII calculator just got better**
In Mid-March 2008, HP's best selling financial calculator the HP 10bII, will be released with a new attractive look.



» **Is it raining again in Seattle…Wait, you mean San Antonio?**
Solve two quick problems that involve fractions, number patterns and the average annual rainfall of a US city.

» **Discount of the Month**
The HP 12c Financial Calculator: a proven industry standard millions of professionals rely on. It's powerful, key-stroke programmable and has HP exclusive features such as time-saving RPN data entry. And now, for this month only, it is 20% off for newsletter readers only. Click here to get your special discount.

## Upcoming HP Calculator events

| Event | Dates - Location |
|---|---|
| CoSN | March 9-12 - Crystal City, VA |
| NCTM National | April 9-12 - Salt Lake City, UT |
| ASEE | June 22-25 - Pittsburgh, PA |
| NECC | June 29-July 2 - San Antonio, TX |
| AP Annual | July 16-20 - Seattle, WA |
| WIPTE | October 15-16 - Westville, IN |
| Educause | October 28-31 - Orlando, FL |

**Volume 2**
**March 2008**

Welcome to the second edition of the HP Solve newsletter. Learn calculation concepts, get advice to help you succeed in the office or the classroom, and be the first to find out about new HP calculating solutions and special offers.

## Featured Calculator

» **HP 12c Financial Calculator**
Get fast, accurate results; the HP 12c is the perfect tax-time tool.

Learn more »

## HP Calculator Blog

Check out Wing Kin Cheung's blog, "The Calculating World with Wing and You."

View blog »

## The Calculator Club

Join the Calculator Club and take advantage of:

- Calculator games & Aplets
- PC/Mac screensavers & backgrounds
- HP Calculator fonts
- Custom calculator pouches
- HP Calculator forum

Register now »

## RPN Tip #2

Learn why the four-high automatic RPN stack is easy to master.

Read more »

# Tax time is here and HP can help

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Tax time is a numbers game and HP can help you come out on top. Whether you are determining deductions such as depreciation and amortization rates or calculating business expenses, capital gains or income, HP financial calculators can help you get the right answer quickly and easily.

So you've gathered all your papers and are ready tackle the task – now you just need some help in crunching the numbers. HP has developed learning modules for each of our financial models that can make this simple. Choose the right tool for your budget or level of need. And, in many cases, it can be a deductible business expense:

- HP 10bII: Affordable and easy to use, it is the #1 selling HP financial calculator
- HP 12c: After 27 years, it has become the industry-standard among finance professionals
- HP 12c Platinum: An advanced version of the venerable 12c
- HP 17bII+: HP's most powerful financial model is menu-driven with the ability to create and store custom calculations (HP Solve)

Once you have chosen your model, it's time to get to work. The following are samples of learning modules that can help you quickly solve your common tax calculations:

Click here to learn how to calculate loan amortization on the HP 10bII

Click here to learn how to solve problems involving dates using the HP 12c

Click here to learn how to calculate depreciation using the HP 12c Platinum

Click here to learn how to create custom calculations using HP Solve on the HP 17bII+

Click here to visit the learning modules section on the HP website for finance and business professionals to access a complete listing of helpful and downloadable tutorials

# Feature calculator of the month: HP 12C Financial Calculator

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Chosen by millions of finance professionals worldwide, the HP 12c is the perfect tax-time tool. Get fast, accurate results with the HP 12c Financial Calculator, continuing to set the standard for financial calculators. The time-tested and iconic horizontal layout offers a one-line adjustable-contrast LCD display and efficient RPN[1] entry. Easily calculate loan payments, interest rates and conversions, standard deviation, percent, TVM, NPV, IRR, cash flows, bonds and more. Over 120 built in functions. Ideal for real estate, finance, accounting, economics and business work. Permitted for use on Certified Financial Planner® (CFP), Chartered Financial Analyst® (CFA), and Global Association of Risk Professionals® Financial Risk Management® (GARP FRM™) exam.[2]

(Footnotes)
1. Reverse Polish Notation (RPN) is an efficient data-entry system that can significantly reduce keystrokes. Click here for more information about RPN
2. CFP® is a registered trademark of the Certified Financial Planner Board of Standards, Inc. CFA is a registered trademark of the CFA Institute. The CFA Institute is not affiliated with Hewlett-Packard and does not endorse or warrant the company or its products. Recommended for use by the Global Association of Risk Professionals (GARP FRM™) for the Financial Risk Management Certification.

Fun facts about the HP 12c Financial Calculator:

- Born: September 16, 1981
- It uses a 4 bit 125Khz CPU with 5 56 bit registers and has used the same the CPU for over 26 years.
- The first handheld calculator to receive certification by the federal Bureau of Standards (now the National Institute of Standards and Technology) due to it's sophisticated accurate and precise calculation algorithms
- Over 15 million of the HP 12c series calculators have been sold
- The ROM code is only 6000 instructions long and it performs over 100 functions.
- Due to clever programming the calculator can perform complex financial functions despite the fact that the only actual operations the microprocessor can calculate are addition and subtraction on integers (numbers without comas).
- The CPU is power-efficient with less than 40K transistors. In comparison, an Intel Pentium CPU has 582 millions transistors or 14550 times more
- Price at introduction: USD$150

Click here for more information about the HP 12c Financial Calculator.

Click here for a detailed history of the HP 12c

# RPN Tip #2

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Human data entry is error prone and this is primary reason machine readable bar codes are used on nearly everything these days. The four-high automatic RPN stack is easy to master and it may be used to avoid having to enter numbers related to a problem more than once.

Suppose you need to evaluate the expression $(A^2 + 3A) \div 1.3$ with an A value of 2.918273645. You could solve the problem three ways.

1. You could press 2.918273645, ENTER, ENTER, ×, X<>Y, 3, ×, +, 1.3, ÷ to calculate 13.2854938478. (seven keystrokes)

2. The experienced RPN user would press 2.918273645, X^2, LASTX, 3, ×, +, 1.3, ÷ to calculate 13.2854938478. (six keystrokes)

The latter method disturbs the stack less and uses fewer keystrokes.

3. The more math minded (student?) would recognize that the algebraic "problem" could be transposed to be:

$$\frac{A( A + 3 )}{1.3}$$

and press 3, ENTER, 2.918273645, +, LASTX, ×, 1.3, ÷ to calculate 13.2854938478.
(five keystrokes)

*NOTE: The above "keystroke counts" or the method of counting is not clear. Because numbers may range from a single digit to 10, 12, or more digits, and these digits would be the same for any machine, they are not counted as keystrokes. To clarify this issue the following is offered.*

***Counting Keystrokes***

RPN Tip #2 showed three RPN methods to solve a problem. Each successive method improved on the method before it in terms of the "efficiency" of the solution. This efficiency is the number of calculator operation keys that have to be pressed to solve the problem. The number of keystrokes is related to three variables.

1. The RPN machine being used. Some RPN operations are shifted keys. R↓, for example, is shifted on the HP35s and several of HP's legacy RPN calculators. Shifted operations require two keystrokes.

2. The order of the operations and the utilization of the RPN automatic stack operations.

3. The mathematical form that is used to express the problem. If the problem is represented by an algebraic expression, for example, the calculator solution is having the expression rearranged for a more efficient calculator keyboard solution. Complete books have been written on the topic of (optimum) "calculator solutions."

Keystroke counting is the only objective measure of comparing the problem solving efficiency of one machine to another or one solution method to another. In order to keep everything on a level playing field the keystrokes required for entering the data (numbers) are not counted. This is illustrated using solution number three of RPN Tip #2.

4. The more math minded (student?) would recognize that the algebraic "problem" could be easily transposed to be:

$$\frac{A( A + 3 )}{1.3}$$

And press 3, ENTER, 2.918273645, +, LASTX, ×, 1.3, ÷ to calculate

*keystroke number* ① ② ③ ④ ⑤

13.2854938478. (Total of five keystrokes).

Click here to learn more about RPN.

# Is it raining again in Seattle… Wait, you mean San Antonio

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Here are two quick problems involving fractions and number patterns. Both of these problems involve trends in the average annual rainfall of a US city. These trends are called 50-year trends and are based on data gathered by the National Oceanic and Atmospheric Administration (NOAA).

**Two Rainy Cities?**

Seattle has long been known for its cloudy, rainy weather; in fact, one of its nicknames is the Rainy City. Since 1961, the average annual precipitation has been just less than 38 2/5". San Antonio, on the other hand, had an average annual precipitation of just less than 30 1/2" over the same period. According to NOAA, San Antonio has a 50-year trend of increasing annual precipitation. If the trend continues, eventually San Antonio will have greater annual precipitation than Seattle currently has. The trend is an additional 1 1/8" of precipitation per decade. Use this information to fill in the first column in the table below. Then estimate the year in which San Antonio's annual precipitation is greater than Seattle's current 38 2/5".

**Two Trends**

Seattle, in the meantime, has its own 50-year annual precipitation trend. According to NOAA, the trend for Seattle is a decreasing one. Seattle gets 2/3" less annual precipitation each decade. With Seattle's annual precipitation decreasing and San Antonio's increasing, at some point the two cities will have the same annual precipitation. Fill in the second column of the table below with rainfall figures. Estimate the year in which both cities have the same annual precipitation. Show your estimate of the number of inches of rainfall that year as well.

| Year | San Antonio (average annual rainfall in inches) | Seattle (average annual rainfall in inches) |
|---|---|---|
| **2007** | $30\frac{1}{2}$ | $38\frac{2}{5}$ |
| **2017** | | |
| **2027** | | |
| **2037** | | |
| **2047** | | |
| **2057** | | |

**Teacher Notes**

These short activities take global warming and climatic change as topics to generate student interest in mixed numbers and number patterns.

**Glencoe Mathematics Series**

In *Texas Mathematics, Course 1*, these activities can be used at the end of Chapter 5 (5.6 and 5.7) as students investigate adding and subtracting mixed numbers. They can also be used in Chapter 6 (6.5 and 6.6) as students investigate arithmetic sequences. In either case, the two activities are best kept together. As an investigation of arithmetic sequences, you can also use these activities with Course 2, Chapter 1 and with Course 3, Chapter 10.

**TEKS**

The following TEKS can be found in this activity set. The TEKS are listed in grade-level order, not the order in which they appear in the activities. Also, some of the TEKS statements are abbreviated or paraphrased here.

The student is expected to:

- 6.1(A) compare and order non-negative rational numbers (also 7.1(A) and 8.1(A))
- 6.2(B) use addition and subtraction to solve problems involving fractions and decimals (also 7.2(B) and 8.2(B))
- 6.2(D) estimate and round to approximate reasonable results and to solve problems where exact answers are not required
- 6.4(A) use tables and symbols to represent and describe proportional and other relationships such as those involving conversions, arithmetic sequences (with a constant rate of change), perimeter, and area
- 6.11(D) select tools such as real objects, manipulatives, paper/pencil, and technology or techniques such as mental math, estimation, and number sense to solve problems (also 7.13(D) and 8.14(D)

**Web Resources**

The information for this exercise was adapted from the web site of the National Oceanic and Atmospheric Administration, or NOAA. From their home page, scroll down a bit and click on the Climate icon. From there, you can get information on many US cities, including Seattle and San Antonio.

**Answer Key for Two Rainy Cities**

In this activity, students learn about precipitation trends predicted by the National Oceanic and Atmospheric Administration (NOAA) for San Antonio. These trends indicate that San Antonio will eventually have greater annual precipitation than Seattle currently has. Will San Antonio be the next "Rainy City"? This activity uses the Mixed Fraction mode to operate on mixed numbers, as well as the ANS function to create number patterns.

1. Go to Modes menu and change Number Format to Mixed Fractions, with an accuracy level of 4 (see Figure 1). Then return to the Home screen.

2. Enter the current annual precipitation figure for San Antonio: 30.5". Note that the HP 39gs changes the decimal to a mixed number, 30+1/2, as in Figure 2.

3. Press the + key and the HP 39gs will enter "ANS +" with the cursor positioned after the + sign. ANS represents the last ANSwer (30 ½), so type in 1+1/8 (Figure 2) and press ENTER to see the annual precipitation for 2017 (one decade later).

4. Press ENTER repeatedly to see the model's predictions for 2027, 2037, etc. Look carefully as you press ENTER and you will see that the annual precipitation reaches 38 3/8 in 2077. This is just under Seattle's 38 2/5. How much less? Just 1/40"! See for yourself by subtracting 38+2/5 from 38+3/8.

**Extension**: If the annual precipitation increases by 1 1/8" in 10 years, how long will it take to increase by 1/40"? You should find it to be 2 2/3 months.

Figure 1: Mixed Fraction format

Figure 2: 30.5 becomes 30 1/2

Figure 3: The first two terms, using ANS

Figure 4: 38 3/8" in 2077

**Answer Key for Two Trends**

In this short activity, students match the increasing trend of San Antonio precipitation to the decreasing trend of Seattle precipitation to estimate the year in which both cities have the same amount of rainfall.

1. Repeat the same process on the HP 39gs, but with an initial starting value of 38 2/5 (see Figure 5) and a decrease of 2/3 (Figure 6). The values are shown in the table below.

Figure 5: Starting the Seattle sequence

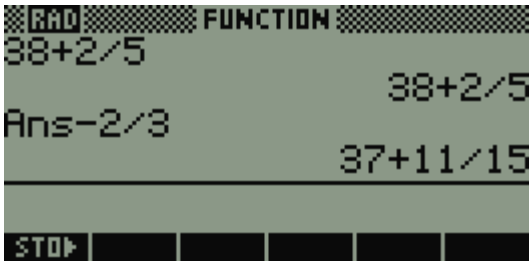

Figure 6: Using ANS again

| Year | San Antonio | Seattle |
|---|---|---|
| **2007** | 30 1/2 | 38 2/5 |
| **2017** | 31 5/8 | 37 11/15 |
| **2027** | 32 3/4 | 37 1/15 |
| **2037** | 33 7/8 | 36 2/5 |
| **2047** | 35 | 35 11/15 |
| **2057** | 36 1/8 | 35 1/15 |

Looking at the table, it is clear that the two cities would be predicted to have identical rainfall totals in one of the years between 2047 and 2057. This is definitely within the life expectancies of the students!

# The best selling real estate HP 10bII Calculator just got better

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The HP 10bII, HP's best selling financial calculator, is easy to use and approved for many courses and exams. The calculator is approved by the CFP, CFA, AFP, CICFP, CCIM institute and is extremely popular among Real Estate and business students and professionals.

In Mid-March 2008, HP will be releasing the HP 10bII with a new, attractive look. The calculator will have the famous HP gem logo and will continue to be light weight and slim. It has over 100 built-in functions for business, finance, mathematics and statistic with quick calculation options for loan payments, TVM, NPV, IRR, cash flows and more. Now you can solve all your basic financial calculations with style.

HP provides FREE calculator training specific to our calculator models and specific exams. Check out the links below:

Click here for free HP 10bII CBT and IREM training

Click here for free HP 10bII intro to finance video training

Click here for free HP 10bII learning modules

# Be a CIO hero!

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See how good it feels knowing that HP is helping you become a CIO hero! HP can help you get the attention you deserve at the next boardroom meeting with the other executives because your IT department brought value and increased productivity to the organizations' workforce.

We understand the challenges that CIOs face everyday. IT decisions in organizations are often made in a vacuum or part of a greater IT business alignment process instead of simply bringing solutions to the organization. IT executives and industry leaders agree that companies who do not treat IT as a strategic element of the organization are more likely to suffer expensive failures. Bringing the right IT tools and solutions to the workforce gives companies the competitive edge they need to be better, faster, and smarter.

Fortunately, CIOs can count on HP to provide calculating solutions for your workforce at a very affordable price. Whether your business is in finance, insurance, real estate, engineering, science, education, etc; HP Calculators have the right calculating solution to meet your business needs. And if you need a good story for management, there is no better value than a HP Calculator. Dollar for dollar, HP Calculators provide the greatest value for productivity. Now is a great time to capitalize on our special B2B bulk purchase program and save money by directly from HP.

HP is committed to help you find the right calculating solutions for just about any job. We will meet with you anytime, and anyplace that's convenient for you - even at your place of business. And HP Total Care offers comprehensive support to keep your workforce operating at peak efficiency.

For more information regarding our B2B calculating solutions, please logon to our HP Calculator Club and fill out our information request form.