



» **HP calculating solutions for all ages!**

Life's journey doesn't end when math class does. HP calculators are there for you as your life takes the many twists and turns, through the grocery lines, tax seasons and more. And now you can save 10%!

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**Volume 7  
August 2008**

Welcome to the seventh 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.

**Your articles**



» **Parent Functions**

Learn to teach the similar and simple relationships between two variables,  $x$  and  $y$ . Here you'll find several great exercises of simple algebra combined with HP calculator functions, perfect for middle school students.



» **Get "personal again" with HP Calculators**

The HP Calculator Club gives you access to several cool ways to show your true colors, and it's always taking new members! Get custom skins for your HP calculator, and express yourself with your gadgets!

**Featured Calculator**



» **HP 39gs Graphing Calculator**

Tackle any tough problems with August's calculator of the month: the HP 39gs. While it's perfect for the classroom, the support and over 600 built-in functions make its usability unsurpassed in other realms as well.

[Learn more »](#)



» **RPN Tip #7**

This month's RPN tip teaches you how to correct a divide input order mistake. When dividing  $A$  and  $B$ , if you accidentally enter  $B$  first, fear not! Learn how to fix it here!



» **The technical corner**

Learn the technical operations behind adding numbers in a calculator in this month's technical corner.

**HP Calculator Blog**

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

[View blog »](#)

**Upcoming HP Calculator events**

**Event**

[WIPTÉ](#)  
[Educause](#)

**Dates - Location**

October 15-16 - Westville, IN  
October 28-31 - Orlando, FL

**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

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# HP Calculating Solutions for all Ages!

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Life's journey takes many twists and turns and HP Calculators offer solutions for you along the way! HP offers fun and colorful Quick Calcs for basic calculations anytime and with a magnetic back you can conveniently store it on the fridge or at your desk. The 10s and 35s are ideal for science and math as you work your way through school. When life gets more complicated and tests get more intricate HP Calculators offers their graphing series with the 39gs, 40gs and 50g. These calculators make any exam more approachable with up to 2300+ built in functions and large equation library. Life's voyage does not end when you graduate. For the professional, HP Calculators recommends a financial calculator such as the 17bll+ or the new 20b Business Consultant which is easy to use with built in menus for statistics and other accounting functions. HP Financial Calculators take the stress out of calculations. And when life calms down and calculations become routine HP has the solution. Our line of OfficeCalcs and the PrintCalc 100 will make retail and payment calculations simple. They are compact and portable and offer a large, easy to read display. Anytime, anywhere HP has the calculating solution for you!



Save 10% on an HP 39gs Graphing Calculator right now. The 39gs is an ideal classroom graphing tool that displays answers in symbolic, numeric and graphing views. And now, for this month only, it is 10% off for newsletter readers. After adding your calculator to your shopping cart, insert coupon code CL1414 at checkout. Expires August 30<sup>th</sup>, 2008. Restrictions apply\*.

[Click here to get your special discount.](#)

\* Offer expires August 30th, 2008. Valid for HP Home & Home Office ([www.hpshopping.com](http://www.hpshopping.com)) internet and call center purchases only. Any unused portion will be forfeited. Each coupon code is limited to one usage per customer; one coupon code per checkout. Offer void where prohibited, taxed or restricted by law. Non-transferable. Not valid retroactively on previously purchased items. Not valid for any resale activity as defined by HP Home & Home Office Store. Coupons may not be used to purchase gift cards. Not valid on instant rebates or clearance sales. For complete coupon conditions, see "Coupon Information" in the "Customer Service" section at [www.hpshopping.com](http://www.hpshopping.com).

Click here for more information about the [HP Calculators](#).

# Feature calculator of the month: HP 39gs Graphing Calculator

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The 39gs is the part of HP's Graphing Calculator series that is ideal for the classroom. This smart calculator can create and store custom applets with 256KB RAM memory and can easily share data and connect to PCs. The HP 39gs can tackle any tough problem with over 600 built-in functions and powerful HP solvers and applications. You can communicate data wirelessly to other 39gs calculators with its built-in two-way infrared port. HP quality and reliability shines in the 39gs with the unique HP click-and-rotate keys and HP quality and award winning support. The HP 39gs is a comprehensive classroom tool that is perfect for all.

1. Reverse Polish Notation (RPN) is an efficient data-entry system that can significantly reduce keystrokes. More information is available at [www.hp.go.com/go/rpn](http://www.hp.go.com/go/rpn).
2. HP Solve is a time-saving application that allows you to solve for any variable without rewriting your equation.

Click [here](#) for more information about the HP 39gs Graphing Calculator.

## RPN Tip #7

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### Correcting a divide input order mistake

If you are dividing two numbers, call them A and B and you want A/B, but you accidentally key B first, there's no need to start over. Finish keying B, press ENTER, and key A. Then press X<>Y before pressing the divide key and you will have the right answer.

If you have already calculated B/A instead of A/B, just press 1/x to get the answer you need.

RPN is very keystroke efficient. For a complete description of RPN as described in RPN Tips see page three of the May 2008 issue, Volume 4.

Click here to learn more about [RPN](#).

# Get “Personal Again” With HP Calculators

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HP understands that it is important for our customers to express themselves with their gadgets. For those of you into HP Calculators, you can now get custom skins for your calculators and decorate your desktop or laptop. If you haven't already, join the HP Calculator Club to access cool computer wallpapers and screensavers.

HP has partnered with **skinit** to provide fun skins for our calculators. You can create your own skin by uploading your own photo or select from a wide variety of categories such as sports, collegiate, comics, art, entertainment, fashion, music, holidays, video games, or skins for a cause. Just go to our partner website: <http://hp.skinit.com/> to check it out!

If you truly want to be an HP Calculator fan and chat with other fans, join the HP Calculator Club at [www.hp.com/go/calclub](http://www.hp.com/go/calclub). It's free to join and you get access to free downloads, coupons, and opportunities to chat with other users. Download your favorite computer wallpaper and screensaver and show everyone you're proud to own an HP Calculator.

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# Parent Functions

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This activity explores three similar and simple relationships between two variables,  $y$  and  $x$  :

- The sum of  $y$  and  $x$  is a constant
- The difference between  $y$  and  $x$  is a constant
- The quotient of  $y$  and  $x$  is a constant

These three relationships occur regularly in real-world applications. Click [here](#) to see a few simple examples:

## The Technical Corner

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How does my calculator add two numbers?

HP calculators store numbers as a set of 3 items: a sign (+ or -), a 12-digit number called a mantissa (always greater or equal to 100,000,000,000), and an exponent. For example, 34.432 is stored as '+', 344320000000, 1.

Multiplying two numbers is one of the simplest operations to perform as there are very little special cases to deal with. However there is some room for optimization in the algorithm.

The first thing to do before trying to multiply two numbers is to deal with the one easy special case:  
 $0 \times 0 = 0$ .

Once this is done, the calculator goes on to calculate the two other easy quantities to compute:

The sign: The sign of the result is positive if both numbers have the same sign or it is negative in all other cases (positive  $\times$  positive  $\rightarrow$  positive, positive  $\times$  negative  $\rightarrow$  negative, negative  $\times$  positive  $\rightarrow$  negative and negative  $\times$  negative  $\rightarrow$  positive).

The exponent: The exponent of the result of the multiplication of two numbers is the sum of the two exponents!

The last part is the actual multiplication. The calculator works in a similar to the way a multiplication is done on paper. It successively multiplies the second number by each digit of the first number and adds all the numbers together.

But here is where things are a little bit different in the calculator. When we do a multiplication by hand, we usually do all the multiplications first and then do the addition. This requires us to write down all the multiplication results. In the case of the HP calculator, 12-digits as we always multiply as a mantissa. In order to save memory space, the calculator does the sum 'on the fly', (i.e. it calculates the first multiplication and immediately adds it to the sum and then keeps going).

Since the calculator does not 'know' multiplication tables of a 12-digit number multiplied by a number between 0 and 9, it recalculates  $y \times 2$ ,  $y \times 4$  and  $y \times 8$  (which is extremely easy to do since they are just additions:  $y \times 2 = y + y$ ,  $y \times 4 = y \times 2 + y \times 2$  and  $y \times 8 = y \times 4 + y \times 4$ ). Then for each digit it multiplies  $y$  by "D" (for example) and then performs four conditional additions ('if'): if D is odd (D modulo 2 is 1), it adds  $y$  to the sum, if D modulo 4 is larger or equal to 2, it adds  $y \times 2$  to the sum... etc. This way, a multiplication of a 12-digit number by D takes only 4 additions at most.

Let us see that in action on a simplified example:

$Y = 1234$  and  $D = 7$ ,  $Y \times 2 = 2468$   $Y \times 4 = 4936$  and  $Y \times 8 = 9872$ .

Note that in the algorithm, the  $Y \times 2$ ,  $Y \times 4$  and  $Y \times 8$  only needs to be calculated once at the beginning and not for each D.

D is odd,  $D \text{ MOD } 4 = 3$ ,  $D \text{ mod } 8 = 7$  and  $D \text{ mod } 10 = 7$ .

So,  $Y \times D = Y + Y \times 2 + Y \times 4 = 8638$

Click here for more information about the [HP Calculators](#).

## Newsletter discount!

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