

Resumão

especial

MATEMÁTICA FINANCEIRA COM A HP 12C

A CALCULADORA

Lançada em 1981, a HP 12C (chamada popularmente de HP) é a calculadora mais conhecida e utilizada por quem necessita trabalhar com cálculos financeiros.

Avançada — trabalha com muitas funções e memórias — e **programável** — possui funções para edição de programas, número ampliado de memórias, etc. —, utiliza o método RPN (sigla em inglês de *Reverse Polish Notation*, ou notação polonesa reversa), criado pelo cientista australiano Charles Hamblin nos anos 50 a partir de um aprimoramento do método de notação polonesa, conhecido desde os anos 20. Esse sistema, combinado com outras características da HP, que é o funcionamento com **pilha operacional**, possibilita realizar operações lógicas encadeadas, com a inserção de todos os dados de uma única vez, diferentemente do que ocorre com as calculadoras que operam no modo algébrico, em que os cálculos complexos devem ser executados etapa a etapa. É por conta desse modo de funcionamento que na HP os elementos devem ser inseridos antes da operação.

Operação	Notação algébrica (calculadoras comuns)	Notação polonesa reversa (HP 12C)
$a+b$	$a+b$	$a+b$
$a+b \times c$	$(a+b) \times c$	$a+b \times c$
$\frac{a-b \times c}{d \div e}$	$((a-b) \times c) \div (d \div e)$	$a-b \times c \div d \div e$

Assim, para realizar a operação $4+6$ na HP, procede-se da seguinte forma:



Ou seja, digitam-se primeiro os elementos da operação e, por último, a operação (no caso, soma), sem a necessidade de digitar [=], tecla que existe na calculadora HP (no visor Pitagoras, a tecla [=] existe, porque um dos diferenciais desse modelo é permitir o uso no modo algébrico de cálculo).

A PILHA OPERACIONAL

A HP utiliza um processo de armazenamento de dados denominado **pilha operacional**, que nada mais é do que um arquivo com quatro registradores (X, Y, Z e T) nos quais são "guardados" os valores necessários à realização das operações. Usa-se o nome "pilha" porque os registros vão sendo "empilhados" dentro da máquina; os dados apresentados no visor são os relativos ao registrador X.

A medida que são inseridos novos dados, eles vão sendo "empilhados" até a realização de operações subsequentes. Utilizando o exemplo anterior, é possível compreender, pela figura a seguir, como funciona a pilha operacional da HP.

USO DO TECLADO

Para selecionar a função secundária localizada na linha acima de uma tecla, aperte a tecla [f] e, em seguida, a tecla de função.

Para selecionar a função primária impressa na face superior de uma tecla, aperte somente a tecla.

Para selecionar a função secundária impressa em azul na face inferior de uma tecla, aperte a tecla [g] e, em seguida, a tecla de função.



Tecla	Registrador	Atividade
[f]	T	Limpa os registros
[1]	X	O número 1 aparece no visor
[2]	X	O número 2 aparece no visor
[3]	X	O número 3 aparece no visor
[4]	X	O número 4 aparece no visor
[5]	X	O número 5 aparece no visor
[6]	X	O número 6 aparece no visor
[7]	X	O número 7 aparece no visor
[8]	X	O número 8 aparece no visor
[9]	X	O número 9 aparece no visor
[0]	X	O número 0 aparece no visor
[.]	X	O ponto decimal aparece no visor
[+/-]	X	O sinal negativo aparece no visor
[=]	X	O resultado aparece no visor

Como dito, é a combinação do sistema RPN e do funcionamento com pilha operacional que permite otimizar as operações na HP em relação às calculadoras convencionais.

Vejamus a seguinte expressão:

$$(7+3) \times (5-4)$$

Enquanto em uma calculadora algébrica (comum) é necessário realizar cada operação colocada entre parênteses de uma vez e anotar o resultado, na HP é possível realizar todas as operações simultaneamente:



Note que as operações são feitas seguindo a hierarquia algébrica (primeira, a que está dentro dos parênteses). Assim, a soma entre os parênteses é a última etapa, precedida ape-

nas depois que a calculadora já armazenou na pilha operacional o resultado da operação de cada um deles.

Nota: a tecla ENTER somente é utilizada para a introdução dos primeiros números. Isso porque, após o segundo número, em cada operação, é dado um comando (soma e subtração). Assim, a calculadora pode identificar que o número "armazenado" não é o primeiro quando se introduz o primeiro valor. Portanto, ENTER "informa" à calculadora que o próximo número a ser digitado não começa mais o primeiro elemento da conta e que ele pode armazenar aquele valor já introduzido na pilha operacional.

TESTE SUA CALCULADORA

Para realizar um teste rápido de funcionamento, proceda da seguinte forma: desligue a calculadora. Com a HP desligada, aperte a tecla correspondente ao sinal de multiplicação [x]. Mantendo a tecla pressionada, tecla [=] e, em seguida, tecla [f]. A calculadora apresentará a mensagem "running" (processando) e, na sequência, o visor mostrará todos os bits ligados, com o sinal (-) à frente, dez números e todas as funções primárias, o que demonstra que sua calculadora está em perfeito funcionamento. Apertando qualquer tecla, a máquina voltará ao modo normal.

MEMÓRIA

A memória da HP é constante, ou seja, conserva os dados armazenados mesmo quando a calculadora é desligada. Há 20 memórias, que são armazenadas em registradores numerados de 0 a 9 e de 0 a 9 (coloca-se o ponto antes do número do registrador).

Por exemplo, para armazenar o número 15 no registrador 1 e o número 71 no registrador 1:



Para recuperar os dados:



Manual Da Hp12c

Jin-Ying Zhang



Manual Da Hp12c:

GUIA PRÁTICO DE UTILIZAÇÃO DA CALCULADORA FINANCEIRA HP12C, 2015-03-10 Este guia para o usuário da HP12C foi criado para auxiliar o discente a aproveitar o máximo possível os recursos da calculadora financeira programável HP12C. Embora a intenção ao adquirir esta poderosa ferramenta financeira possa lhe fazer colocar este texto de lado e começar a apertar botões imediatamente no longo prazo você ganhará se tiver lido esta guia e experimentado os exemplos apresentados.

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ABSTRACT This book includes concepts examples and exercises about financial education and personal finance 1 Introduction which addresses financial education making a synthesis on personal goals money debts retirement insurance and personal finance referring to financial investments term purchases and financial traps 2 Financial control which demonstrates how work the tables of payment receipts cash flow financial investments and equity position 3 The time value of money which includes the study of interest rates the basic inflation indexes the rate of currency devaluation the real interest rate the present value the future value and the use of HP12C calculator 4 Financial planning which examines saving and life cycle social security private pension career expenses and the decision to buy or rent a property 5 Financial investment which addresses the factors modalities investment funds and income tax on financial investments 6 Digital currency which deals with bitcoin blockchain system security and the generation of bitcoins 7 References which indicates the bibliography consulted 8 Attachments which includes the answers to the review questions a list of exercises with the solution a questionnaire model on numerical ability and risk profile and a summary of investment funds

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