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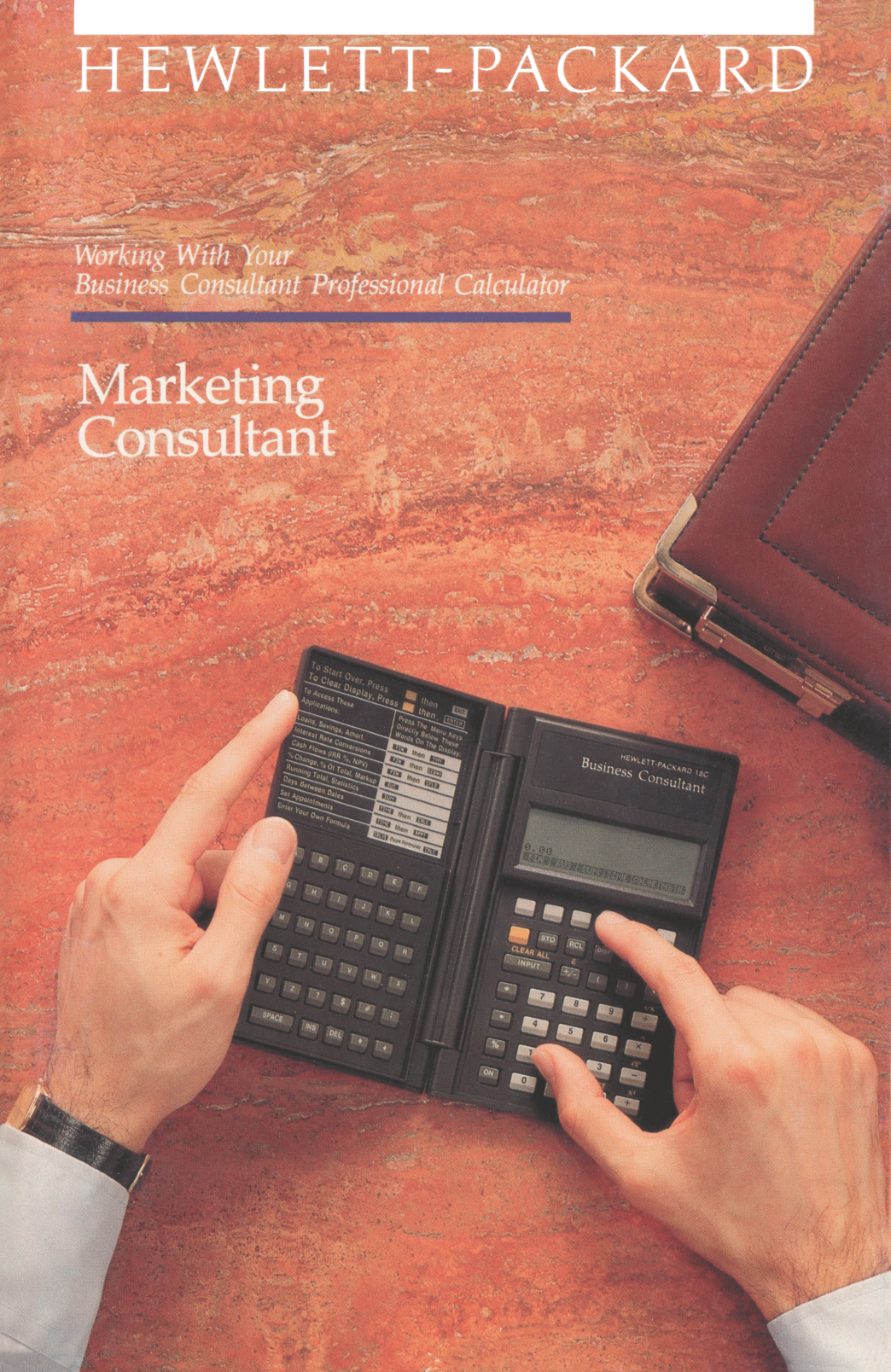
Working With Your
Business Consultant Professional Calculator

Marketing Consultant



Marketing Consultant

Business Consultant
Professional Calculator

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Welcome...

...to the Consultant applications series! This series is designed to help you get the most from your Business Consultant professional calculator.

The purpose of the *Marketing Consultant* is to help you solve the specialized problems your industry or profession demands. We've worked with professionals in your field to provide a sample of analysis concepts that are useful and relevant. Included are keystrokes and routines to help you analyze sales, pricing, your market and profit. The *Marketing Consultant* is designed to serve both as a reference and a starting point for using the Business Consultant to develop your own unique analyses.

Before you use the solutions in this book, you should be familiar with certain concepts from the owner's manual:

- Chapter 1: the basics of your calculator—how to move from menu to menu, identify and move to the MAIN menu, and use the menu keys to do calculations.
- Chapter 9: entering and using formulas.

The examples in this book show two decimal places. If your display is set to something other than two, the answers in your display will not match exactly what is in this book. Refer to your owner's manual for more information about changing the number of decimal places.

For more information about the topics in the *Marketing Consultant,* refer to a basic textbook on the subject. Specific sources on the more specialized topics are included at the end of those topics.

Contents

When Entering Formulas...

When entering formulas into your Business Consultant, follow the instructions in chapter 9 of your owner's manual. Here are hints to help you in common error situations:

1. If the calculator displays `INVALID FORMULA` when you press CALC, the calculator doesn't understand something in the formula. When the formula returns to the screen, the cursor is positioned where your calculator detected the error. Check the formula in the screen against the formula in the book. Make sure the parentheses match and that the operators are where they should be.
2. If the calculator accepts the formula but your answer doesn't match the example, check the values stored in the menu key variables by recalling them (press RCL, then the menu key). If the values are correct, return to the SOLVE menu and check the formula. (Press EXIT to return to the SOLVE menu and press EDIT to view and edit the formula.) Check the formula against the one in this book for accuracy. When you find an error, edit the formula and press CALC to display the custom menu again.
3. If the calculator displays `INSUFFICIENT MEMORY` when you press INPUT or CALC, you must free portions of memory before continuing. Refer to pages 188 and 189 of the owner's manual for additional information.

The formulas in the *Marketing Consultant* use variable names that are intended to remind you of what to store. Feel free to change them to something more meaningful to you.

Markup Calculations

Markup calculations are used by retailers and wholesalers to determine the selling price of an item. Your Business Consultant includes a built-in menu for calculating markup as a percent of cost and markup as a percent of price.

1. From the MAIN menu, press BUS to display the BUS menu.
2. Press MU%C to display the MU%C (markup on cost) menu, or MU%P to display the MU%P (markup on price) menu.
3. Store each of the values you know by keying in the number and pressing the appropriate menu key.
4. Press the menu key for the value you want to calculate.

Example 1: Calculating selling price and markup as a percent of cost given cost and markup as a percent of price. Part 1. An item costs $160. The reseller's required markup as a percent of selling price is 20%. What is the selling price?

Start from the MAIN menu.

Keys:	Display:	Description:
BUS MU%P		Displays MU%P menu.
160 COST	COST=160.00	Stores your cost.
20 M%P	MARKUP%P=20.00	Stores markup as a percent of price.
PRICE	PRICE=200.00	Calculates selling price.

Part 2. What is the markup as a percent of the cost?

EXIT MU%C		Displays MU%C menu.
M%C	MARKUP%C=25.00	Calculates markup as a percent of cost.

Example 2: Calculating cost and markup as a percent of price given selling price and markup as a percent of cost. Part 1. An item sells for $21.00. The markup as a percent of cost is 50%. What is its cost?

Start from the MAIN menu.

Keys:	Display:	Description:
BUS MU%C		Displays MU%C menu.
21 PRICE	PRICE=21.00	Stores selling price.
50 M%C	MARKUP%C=50.00	Stores markup as a percent of cost.
COST	COST=14.00	Calculates your cost.

Part 2. What is the markup expressed as a percent of price?

EXIT MU%P		Displays MU%P menu.
M%P	MARKUP%P=33.33	Calculates the markup as a percent of price.

Example 3: Calculating cost and markup on cost given selling price and markup on price. Part 1. An item sells for $38, with a markup on price of 30%. What is the markup on cost?

Start from the MAIN menu.

Keys:	Display:	Description:
BUS MU%P		Displays MU%P menu.
38 PRICE	PRICE=38.00	Stores selling price.
30 M%P	MARKUP%P=30.00	Stores markup on price.
COST	COST=26.60	Calculates your cost.
EXIT MU%C		Displays MU%C menu.
M%C	MARKUP%C=42.86	Calculates markup on cost.

Part 2. If the markup on cost is raised to 50%, what is the new selling price?

50 M%C	MARKUP%C=50.00	Stores new markup on cost.
PRICE	PRICE=39.90	Calculates new selling price.

Setting a Sales Price

One method of setting a unit sales price is to determine the unit cost of production then multiply by the desired rate of return. For this method to be accurate, you must identify all costs associated with the product.

Entering and Using the PRICE Formula:

1. From the MAIN menu, press SOLVE to display the SOLVE menu.
2. Type in the PRICE formula as follows:

   PRICE=COST÷UNITS×(1+%RTN÷100)
3. Press CALC to verify the formula and display the custom menu.
4. Store three of the following variables:
   - Price per unit in PRICE.
   - Total costs in COST.
   - Number of units produced in UNITS.
   - Desired percent rate of return in %RTN.
5. Press the menu key to calculate the unknown variable.

Example: Part 1. To produce 100,000 units, your cost is $1,000,000. You want a 20% rate of return. What price should you charge?

Start from the PRICE custom menu.

Keys:	Display:	Description:
1000000 COST	COST= 1,000,000.00	Stores total production costs.
100000 UNITS	UNITS=100,000.00	Stores number of units.
20 %RTN	%RTN=20.00	Stores rate of return.
PRICE	PRICE=12.00	Calculates price.

Part 2. You know that on this particular product, you can only charge $11.50. At that price, what is your rate of return?

11.5 PRICE	PRICE=11.50	Stores price.
%RTN	%RTN=15.00	Calculates percent rate of return.

Forecasting Sales Based on History

One method of forecasting sales is to look at historical trends. Once you have historical data, the data are fit to a curve with time on the x-axis, and the quantity you are forecasting on the y-axis. Linear curve fit is appropriate if you have a fairly constant growth rate; exponential curve fit is appropriate with compound growth, such as might occur for sales of a new product.

1. From the MAIN menu, press SUM to display the SUM menu.
2. Press CLEAR ALL YES to clear the list. (If you don't want to delete the list, name the old list and get a new one.)
3. Enter your time data. Press INPUT after each item.
4. Name your list.
5. Press GET *NEW to get a new list and enter your sales data as in step 3.
6. Name your list.
7. Press CALC, MORE, then FRCST.
8. Select the list containing your x-values.
9. Select the model (LIN for linear, EXP for exponential).
10. Key in the x-value and press XLIST.
11. Press YLIST to forecast the y-value.

Example 1: Forecasting sales using linear curve fit. You want to determine the sales forecast for the next two years using a linear curve fit. The following data represents your sales for the past nine years.

Year	Sales ($)
1	100,000
2	112,100
3	130,600
4	160,750
5	205,900
6	210,000
7	240,650
8	280,720
9	325,190

Start from the MAIN menu.

Keys:	Display:	Description:
SUM *		Displays SUM menu.
CLEAR ALL YES		Clears the list.
1 INPUT 2 INPUT 3 INPUT 4 INPUT 5 INPUT 6 INPUT 7 INPUT 8 INPUT 9 INPUT	TOTAL=45.00	Enters time values.
NAME YEARS INPUT		Names the list.
GET *NEW		Displays a new list.
100000 INPUT 112100 INPUT 130600 INPUT 160750 INPUT 205900 INPUT 210000 INPUT 240650 INPUT 280720 INPUT 325190 INPUT	TOTAL= 1,765,910.00	Enters sales data.
NAME SALES INPUT		Names the list.
CALC MORE FRCST		Displays FRCST menu.
YEARS		Selects list YEARS as the x-variable.

* If you want to preserve the current list, skip the next step (pressing CLEAR ALL), name the list, then press GET *NEW.

LIN		Selects linear model.
10 XLIST	XLIST=10.00	Stores year 10 as the x-value.
YLIST	YLIST=335,876.39	Calculates a y-value—sales forecast for year 10.
11 XLIST	XLIST=11.00	Stores year 11 as the x-value.
YLIST	YLIST=363,809.22	Calculates a y-value—sales forecast for year 11.

Example 2: Forecasting sales using exponential curve fit. The sales history for your new product is shown below for the first six months after introduction.

Month	Sales ($K)
June	31.7
July	52.5
August	48.3
September	56.6
October	72.7
November	90.9

Part 1. Using the exponential model, estimate the sales for December.

Start from the MAIN menu.

Keys:	Display:	Description:
SUM *		Displays SUM menu.
CLEAR ALL YES		Clears the list.
1 INPUT 2 INPUT 3 INPUT 4 INPUT 5 INPUT 6 INPUT	TOTAL=21.00	Enters month numbers.
NAME MONTHS INPUT		Names the list.
GET *NEW		Displays a new list.
31.7 INPUT 52.5 INPUT 48.3 INPUT 56.6 INPUT 72.7 INPUT 90.9 INPUT	TOTAL=352.70	Enters monthly sales.
NAME MOSLS INPUT		Names the list.
CALC MORE FRCST		Displays FRCST menu.
MONT		Selects list MONTH as the x-variable.
EXP		Selects exponential model.
7 XLIST	XLIST=7.00	Stores month 7 as the x-value.
YLIST	YLIST=105.78	Calculates a y-value—projected sales for December, the seventh month.

* If you want to preserve the current list, skip the next step (pressing CLEAR ALL), name the list, then press GET *NEW.

Part 2. Calculate the continuous compound growth rate.

B [×] 100 [=]	18.29	Calculates the estimate of the monthly compound growth rate.

Forecasting Sales Using Simple Moving Average

Moving averages are often useful in forecasting sales. In a moving average, a specified number of data points are averaged. When there is a new piece of input data, the oldest piece of data is discarded to make room for the most recent data. This replacement scheme makes the moving average a valuable tool in following trends. The fewer the number of data points, the more trend sensitive the averages become. With a large number of data points, the average behaves more like a regular average, responding slowly to new input.

1. From the MAIN menu, press SUM to display the SUM menu.
2. Press CLEAR ALL YES to clear the list. (If you don't want to delete the list, name the old list and get a new one.)
3. Enter your data points.
4. Press CALC, then MEAN to calculate the average.
5. When you have a new data point, move the pointer to the oldest item. Enter the new item and press INPUT. The oldest item is replaced by the new one.

Example. You want to calculate a 3 month moving average for the units sold each month. Volumes for the first six months were:

January	4400	April	3670
February	5360	May	4040
March	2900	June	3200

Start from the MAIN menu.

Keys:	Display:	Description:
SUM *		Displays SUM menu.
■ CLEAR ALL YES		Clears the list.
4400 INPUT 5360 INPUT 2900 INPUT	TOTAL=12,660.00	Enters sales for the first three months.
CALC MEAN	MEAN=4,220.00	Calculates the average for the first three months.
EXIT		
■ ↑		Moves pointer to top of list.
3670 INPUT	TOTAL=11,930.00	Enters month four and deletes oldest item.
CALC MEAN	MEAN=3,976.67	Calculates average for months two, three and four.
EXIT		
4040 INPUT	TOTAL=10,610.00	Enters month five and deletes oldest item.
CALC MEAN	MEAN=3,536.67	Calculates average for months three, four and five.
EXIT		
3200 INPUT	TOTAL=10,910.00	Enters month six and deletes oldest item.
CALC MEAN	MEAN=3,636.67	Calculates average for months four, five and six.

* If you want to preserve the current list, skip the next step (pressing ■ CLEAR ALL), name the list, then press GET *NEW.

Forecasting Sales of Accessories

Many products have optional accessories or peripheral products. For example, cars have lots of extras and computers have software and optional equipment.

The sales forecasts of these optional items can be based on a percentage of the sales of the main product. The following equation helps determine sales forecasts of these optional products.

Although this calculation is simple to do on any calculator, using SOLVE means you don't have to reenter values to calculate many optional products for one main product, or to try what-if situations.

Entering and Using the #OPT Formula:

1. From the MAIN menu, press SOLVE to display the SOLVE menu.
2. Type in the #OPT formula as follows:

   `#OPT=#MAIN×(%MAIN÷100)`
3. Press CALC to verify the formula and display the custom menu.
4. Store two of the following variables:
   - Units of the optional product in #OPT.
   - Units of the main product in #MAI.
   - Percent of main product in %MAI.
5. Press the menu key to calculate the unknown variable.

Example: Part 1. Seventy-five percent of your customers are expected to order a particular software product to use with your computer. The computer is forecast to sell 1,100 units per month. What should your sales forecast be for the software product?

Start from the #OPT custom menu.

Keys:	Display:	Description:
1100 #MAI	#MAIN=1,100.00	Stores computer forecast.
75 %MAI	%MAIN=75.00	Stores percent expected to buy the software.
#OPT	#OPT=825.00	Calculates software sales forecast.

Part 2. Last month, computer sales were 900 units and software sales were 750. What should the software sales forecast be to reflect last month's actual sales rate?

750 #OPT	#OPT=750.00	Stores number of software products sold last month.
900 #MAI	#MAIN=900.00	Stores number of computers sold last month.
%MAI	%MAIN=83.33	Calculates percent of computer sales.
1100 #MAI	#MAIN=1,100.00	Stores computer forecast.
#OPT	#OPT=916.67	Calculates new software forecast.

Revising Your Forecast to Reflect Current Market Conditions

Most sales forecasts are based on certain assumptions about, and incomplete knowledge of, your market and competition. After the forecasts are made, internal and external changes make your original assumptions and your forecast incomplete. Examples of these changes in the market that were not reflected in the original forecast are a price drop (yours or your competitors), advertising or promotional campaign, rebate offer, introduction of a new product by a competitor, or a change in distribution of your product. The formula below helps you revise your forecast, based on the perceived impact of the market changes.

Entering and Using the NEWFCST Formula:

1. From the MAIN menu, press SOLVE to display the SOLVE menu.
2. Type in the NEWFCST formula as follows:*

   `NEWFCST=BASE+((A%+B%+C%)÷100)×BASE`
3. Press CALC to verify the formula and display the custom menu.
4. Store the following variables:
   - Original forecast in BASE.
   - Expected change in sales caused by each change in the market in A%, B%, and C%.*
5. Press NEWF to calculate the new forecast.

* This formula can be modified to fit the number of changes for your current market conditions. For example, if you have two factors, omit `+C%`; if you have five factors, change the part in parentheses to `(A%+B%+C%+D%+E%)`.

Example. The forecast for your product for next month is 2,000 units. Three market changes have occurred that are not reflected in your current forecast. The price on the product has dropped (causing an expected 20% increase in sales), a major sales force training program started (causing an expected 5% increase in sales), and you've learned that a competitor is introducing a new product (creating an expected 15% cut into your sales). Calculate the new forecast for next month.

Start from the NEWFCST custom menu.

Keys:	Display:	Description:
2000 BASE	BASE=2,000.00	Stores original forecast.
20 A%	A%=20.00	Stores sales increase expected due to price drop.
5 B%	B%=5.00	Stores sales increase expected due to sales force training.
15 +/- C%	C%=-15.00	Stores sales decrease due to new product introduced by a competitor.
NEWF	NEWFCST=2,200.00	Calculates new forecast for the month.

Planning Advertising Expenditures

The advertising-sales ratio helps marketers and advertisers determine how much money to spend for advertising, based on projected sales. To use the formula below, you need to know the forecast unit sales, revenues per unit, and the percent of sales to be spent on advertising.

Although this calculation is simple to do on any calculator, using SOLVE makes it easy to try what-if situations, and analyze how a change in advertising dollars or revenues will change advertising as a percent of sales.

Entering and Using the AD$ Formula:

1. From the MAIN menu, press SOLVE to display the SOLVE menu.
2. Type in the AD$ formula as follows:

   `AD$=#UNITS×$REV×(AD%÷100)`
3. Press CALC to verify the formula and display the custom menu.
4. Store three of the following variables:
   - Advertising cost in AD$.
   - Number of units forecast to be sold in #UNI .
   - Dollars of revenue per unit (price less discount) in $REV .
   - Percent of sales that makes up the advertising budget in AD% .
5. Press the menu key to calculate the unknown variable.

Example: Part 1. You expect to sell 78,000 units next month. The unit revenue is $10. The normal advertising budget is 5% of projected sales. How much can you spend on advertising next month?

Start from the AD$ custom menu.

Keys:	Display:	Description:
78000 #UNI	#UNITS=78,000.00	Stores sales forecast.
10 $REV	$REV=10.00	Stores unit revenue.
5 AD%	AD%=5.00	Stores advertising percent.
AD$	AD$=39,000.00	Calculates advertising dollars for the month.

Part 2. To become a major factor in the marketplace, you feel you should spend $60,000 on advertising next month. What percentage of your revenue must you convince management to spend?

60000 AD$	AD$=60,000.00	Stores advertising dollars.
AD%	AD%=7.69	Calculates advertising as a percent of revenue.

Stockturn or Inventory Turnover Rate

The stockturn or inventory turnover rate is a measure of the number of times the average inventory is sold in a year. The stockturn rate is important because it shows how rapidly the firm's inventory is moving. The data needed to compute the stockturn rate are beginning and ending inventory in cost dollars and the cost of the goods sold, or, the beginning and ending inventory in retail dollars and the retail dollars sold.

Entering and Using the STURN Formula:

1. From the MAIN menu, press SOLVE to display the SOLVE menu.
2. Type in the STURN formula as follows:

   STURN=$SOLD÷((BEGINV+ENDINV)÷2)
3. Press CALC to verify the formula and display the custom menu.
4. Enter three of the following variables; remember that all dollar values must be either cost dollars or retail dollars, depending on your business:
   - Stockturn rate in STURN.
   - Dollars sold in $SOL.
   - Beginning inventory in dollars in BEGI.
   - Ending inventory in dollars in ENDI.
5. Press the menu key to solve for the unknown variable.

Example: Part 1. Last year the cost of the goods that were sold was $30,000, beginning inventory was $8,000 and ending inventory was $7,000. Calculate the stockturn rate.

Start from the STURN custom menu.

Keys:	Display:	Description:
30000 $SOL	$SOLD=30,000.00	Stores dollars sold.
8000 BEGI	BEGINV=8,000.00	Stores beginning inventory.
7000 ENDI	ENDINV=7,000.00	Stores ending inventory.
STURN	STURN=4.00	Calculates stockturn rate for the year.

Part 2. Suppose the company prefers inventory with a limited shelf life to turn every two months (6 times a year). How would this change your ending inventory?

6 STURN	STURN=6.00	Stores desired stockturn rate.
ENDI	ENDINV=2,000.00	Calculates ending inventory.

Break-Even Analysis

Break-even analysis is a technique for analyzing the relationships among fixed costs, variable costs, and income. Until the break-even point is reached (total costs equal total income), the producer operates at a loss. After the break-even point, each unit produced and sold makes a profit. The variables in the formula below are fixed costs, variable costs per unit, sales price per unit, number of units sold, and gross profit.

Entering and Using the PROFIT Formula:

1. From the MAIN menu, press SOLVE to display the SOLVE menu.
2. Type in the PROFIT formula as follows:

   `PROFIT=#SOLD×(PRICE-VARCO)-FIXCO`
3. Press CALC to verify the formula and display the custom menu.
4. Store four of the following variables:
   - Gross profit in PROFI.
   - Number of units sold in #SOL.
   - Selling price per unit in PRICE.
   - Variable costs per unit in VARCO.
   - Fixed costs in FIXCO.
5. Press the menu key to calculate the unknown variable.

Example: Part 1. Your product sells for $13. The fixed costs are $12,000. Variable costs are $6.75 per unit. Calculate the number of units that must be sold to break even (profit equals zero).

Start from the PROFIT custom menu.

Keys:	Display:	Description:
0 PROFI	PROFIT=0.00	Stores break-even profit of zero.
13 PRICE	PRICE=13.00	Stores price per unit.
6.75 VARCO	VARCO=6.75	Stores variable costs per unit.
12000 FIXCO	FIXCO=12,000.00	Stores fixed costs.
#SOL	#SOLD=1,920.00	Calculates number that must be sold to break even.

Part 2. Calculate the gross profit if 2,500 units are sold.

2500 #SOL	#SOLD=2,500.00	Stores number sold.
PROFI	PROFIT=3,625.00	Calculates gross profit.

Part 3. You want a gross profit of $4,500, at the sales volume in part 2 (2,500 units). What should the selling price be?

4500 PROFI	PROFIT=4,500.00	Stores required gross profit.
PRICE	PRICE=13.35	Calculates required selling price.

Estimating the Financial Feasibility of New Product Ideas

One way to analyze a new product idea is to estimate the costs for development, the expected profit and the life of the product, then calculate the internal rate of return. Net present value (NPV) and internal rate of return (IRR) are used to determine if an investment meets a minimum rate of return and what rate of return can be expected. The built-in CFLO menu makes it easy to calculate these two values.

1. From the MAIN menu, press FIN, then CFLO to display the CFLO menu.
2. Press ■ CLEAR ALL YES to clear the current list. (If you don't want to delete the list, name the current list and get a new list.)
3. Enter the cash flows and number of periods.
4. Press CALC to display the CFLO CALC menu.
5. To calculate the net present value, enter the periodic interest rate as a percent in I%, then press NPV.
6. To calculate the internal rate of return, press IRR%.

Example: Part 1. Development costs on a new product are estimated to be one million dollars. Unit sales are estimated to be 4,000 units the first year, 5,000 in years two, three and four, and 3,000 in years five and six. Revenue (price less discount) per unit is $1,000. Your anticipated net profit is 8%. What is the IRR on the product?

Start from the MAIN menu.

Keys:	Display:	Description:
FIN CFLO *		Displays CFLO menu.
[shift] CLEAR ALL YES		Clears list
1000000 +/- INPUT		Enters initial cash flow.
4000 × 1000 × 8 % INPUT INPUT		Enters profit for year one as FLOW(1).
5000 × 1000 × 8 % INPUT 3 INPUT		Enters profit for years two, three and four as FLOW(2).
3000 × 1000 × 8 % INPUT 2 INPUT		Enters profit for years five and six as FLOW(3).
CALC		Displays CALC menu.
IRR%	IRR%=26.01	Calculates internal rate of return.

Part 2. Your company requires an IRR% of 30%. Calculate the development costs that would meet this goal.

30 I%	I%=30.00	Stores required rate of return.
NPV	NPV=-80,680.92	Calculates the net present value of the cash flows discounted at 30%.
EXIT [shift] ↑ − RCL INPUT =	919,319.08	Calculates development costs to meet 30% IRR, assuming no change in cash flows.

* If you want to preserve the current list, skip the next step (pressing [shift] CLEAR ALL), name the list, then press GET *NEW.

Part 3. Suppose your actual profits are 25% less than forecast. Calculate the IRR%.

↓		Moves pointer to FLOW(1).
RCL INPUT − 25 % INPUT ↓		Reduces FLOW(1) by 25%.
RCL INPUT − 25 % INPUT ↓		Reduces FLOW(2) by 25%.
RCL INPUT − 25 % INPUT		Reduces FLOW(3) by 25%.
CALC		Displays CFLOW CALC menu.
IRR%	IRR%=13.88	Calculates rate of return with 25% less profit per year.

Return on Investment

Another way of evaluating a new investment is through a simple return on investment (ROI) analysis. Return on investment (ROI) is the ratio of net profit after taxes to the assets used to make the net profit.

Although this calculation is simple to do on any calculator, using SOLVE makes it easy to try what-if situations, and analyze what you can do to meet a minimum return on investment.

Entering and Using the ROI% Formula:

1. From the MAIN menu, press SOLVE to display the SOLVE menu.
2. Type in the ROI% formula as follows:

   `ROI%=($REV×PROF%÷100)÷$INV×100`
3. Press CALC to verify the formula and display the custom menu.
4. Store three of the following variables:
   - Return on investment as a percent in ROI%.
   - Total revenues in $REV.
   - Net profit as a percent of revenues in PROF%.
   - Capital investment in the project or business in $INV.
5. Press the menu key to calculate the unknown variable.

Example: Part 1. A new store requires $480,000 in new assets. The anticipated revenues the first year are $1,000,000. Your net profit goal is 10%. Assuming the net profit goal is met, calculate the return on investment.

Start from the ROI% custom menu.

Keys:	Display:	Description:
1000000 $REV	$REV= 1,000,000.00	Stores total anticipated revenues.
10 PROF%	PROF%=10.00	Stores net profit percent.
480000 $INV	$INV=480,000.00	Stores investment.
ROI%	ROI%=20.83	Calculates percent return on investment.

Part 2. The store's sales are actually $750,000 in the first year. Calculate the ROI%.

750000 $REV	$REV=750,000.00	Stores actual revenues.
ROI%	ROI%=15.63	Calculates percent return on investment.

Part 3. At the level of revenues in part 2, what total investment can you sustain to achieve an ROI% of 18%.

18 ROI%	ROI%=18.00	Stores required ROI%.
$INV	$INV=416,666.67	Calculates investment to reach this goal.

Part 4. Suppose you realize a 5% net profit on revenues of $750,000. Your investments are $480,000, as in part 1. Calculate the ROI%.

5 PROF%	PROF%=5.00	Stores net profit.
480000 $INV	$INV=480,000.00	Stores investment.
ROI%	ROI%=7.81	Calculates return on investment.

Elasticity of Demand

Elasticity of demand is a measure of how sensitive the market demand is for a product relative to price changes in the product. If a small price change results in a large change in demand, the demand is said to be highly elastic. The formula below calculates a relative measure of elasticity. You can project changes in sales given changes in prices, assuming that a price change is the only factor affecting the change in quantity.

Entering and Using the ELAST Formula:

1. From the MAIN menu, press SOLVE to display the SOLVE menu.
2. Type in the ELAST formula as follows:

   ```
   ELAST=(LOPQ-HIPQ)÷(LOPQ+HIPQ)÷2
   ÷-(LOWP-HIP)×(LOWP+HIP)×2
   ```

3. Press CALC to verify the formula and display the custom menu.
4. Store the following variables:
   - Quantity sold at the lower price in LOPQ.
   - Quantity sold at the higher price in HIPQ.
   - Lower price in LOWP.
   - Higher price in HIP.
5. Press ELAST to calculate the elasticity of demand.

Example: Part 1. You lowered the price on your product from $150 to $100. Sales increased from 11,000 units to 15,000 units. Assuming that the price change was the only factor effecting sales, calculate the estimated elasticity of demand.

Start from the ELAST custom menu.

Keys:	Display:	Description:
15000 LOPQ	LOPQ=15,000.00	Stores quantity sold at lower price.
11000 HIPQ	HIPQ=11,000.00	Stores quantity sold at higher price.
100 LOWP	LOWP=100.00	Stores lower price.
150 HIP	HIP=150.00	Stores higher price.
ELAST	ELAST=0.77	Calculates the elasticity of demand.

Part 2. You have another product, priced at $120. You are currently selling 18,000 units per month. Your knowledge of your market indicates that the elasticity of demand for this product is the same as for the product in example 1, that is, 0.77. Calculate the quantity sold, based on a price decrease of $25.

.77 ELAST	ELAST=0.77*	Stores elasticity of demand.
18000 HIPQ	HIPQ=18,000.00	Stores quantity sold at the higher price.
120 − 25 LOWP	LOWP=95.00	Stores lower price.
120 HIP	HIP=120.00	Stores higher price.
LOPQ	LOPQ=21,540.23†	Calculates an estimate of the quantity sold at the lower price.

* If you do not store .77 in ELAST, but use the value calculated in part 1, the quantity sold at the new price will be different, because the ELAST value calculated in part 1 is not exactly .77.

† The solver searches for a numerical solution and displays intermediate estimates.

Sales Analysis

Sales analysis compares actual sales to sales goals. The formulas below use forecast sales, forecast price, actual sales and actual price to calculate sales variance, variance due to a price change and variance due to volume change.

Entering and Using the Formulas:

1. From the MAIN menu, press SOLVE to display the SOLVE menu.
2. Type in the VOLVAR (volume variance) formula as follows:

   `VOLVAR=FPRICE×(FCST#-ACT#)`
3. Press INPUT to verify the formula.
4. Type in the PRICEVAR (price variance) formula as follows:

   `PRICEVAR=(FPRICE-APRICE)×ACT#`
5. Press INPUT to verify the formula.
6. Type in the SLSVAR (sales variance) formula as follows:

   `SLSVAR=FCST#×FPRICE-ACT#×APRICE`
7. Press CALC to verify the formula and display the SLSVAR custom menu.
8. Store the following variables:
   - Number of units forecast in FCST.
   - Forecast price per unit in FPRIC.
   - Number of units actually sold in ACT#.
   - Actual selling price in APRIC.
9. Press SLSVA to calculate the sales variance.
10. Press EXIT to display the SOLVE menu. Move the pointer to the PRICEVAR formula. Press CALC to verify the formula and display the PRICEVAR custom menu.
11. Press PRICE to calculate the variance due to price.
12. Press EXIT to display the SOLVE menu. Move the pointer to the VOLVAR formula. Press CALC to verify the formula and display the VOLVAR custom menu.
13. Press VOLVA to calculate the variance due to volume.

Example: Part 1. In your marketing plan, you forecast monthly sales to be 1,000 units, at $425. Actual sales were 730 units, at $410. What is the sales variance?

Start from the SLSVAR custom menu.

Keys:	Display:	Description:
1000 FCST	FCST#=1,000.00	Stores forecast sales.
425 FPRIC	FPRICE=425.00	Stores forecast price.
730 ACT#	ACT#=730.00	Stores actual sales.
410 APRIC	APRICE=410.00	Stores actual price.
SLSVA STO 0	SLSVAR= 125,700.00	Calculates sales variance and stores it for use in part 4.

Part 2. Calculate the portion due to price change.

EXIT		
↑ or ↓	PRICEVAR=(FPRICE	Selects PRICEVAR formula.
CALC		Displays PRICEVAR custom menu.
PRICE PRICE *	PRICEVAR= 10,950.00	Calculates portion due to price change.

Part 3. Calculate the portion due to volume change.

EXIT		
↑ or ↓	VOLVAR=FPRICE×(F	Selects VOLVAR formula.
CALC		Displays VOLVAR custom menu.
VOLVA	VOLVAR= 114,750.00	Calculates portion due to volume change.

* Pressing PRICE the first time stores the value on the calculator line in PRICE. Pressing PRICE again causes the calculation to occur.

Part 4. Calculate the percentage of the total sales variance that is due to a change in volume.

MAIN		Displays MAIN menu.
BUS %TOTL		Displays %TOTL menu.
STO PART	PART=114,750.00	Stores volume variance.
RCL 0 TOTAL	TOTAL=125,700.00	Stores total variance.
%T	%TOTAL=91.29	Volume change is 91% of the variance in sales.

Ninety percent of the sales variance is due to the shortfall in volume. The next step would be to analyze what caused sales to fall short of the goal.

Source: Philip Kotler, *Marketing Management: analysis, planning, and control* (Fifth Edition). Englewood Cliffs, N.J.: Prentice-Hall, 1984.

Total Market Size Potential

Total market size potential is the total sales (in dollars or units) available to all firms selling a given product for a specified time. To estimate the total market potential, you need to estimate the number of buyers of the product, the quantity each buyer will purchase, and the average price of the product.

Entering and Using the POTENTIAL Formula:

1. From the MAIN menu, press SOLVE to display the SOLVE menu.
2. Type in the POTENTIAL formula as follows:

   POTENTIAL=#BYRS×QUANT×PRICE
3. Press CALC to verify the formula and display the custom menu.
4. Store the following variables:
   - Estimated total number of buyers in #BYR.
   - Quantity each buyer will purchase in QUAN.
   - Average retail price of the product in PRICE.
5. Press POTEN to calculate the total market potential.

Example: Part 1. Market research shows that the estimated number of buyers for your product is 3 million people this year, and that each buyer will purchase 1.3 units. The average price for the product is $95. What is the total market potential?

Start from the POTENTIAL custom menu.

Keys:	Display:	Description:
3000000 #BYR	#BYRS= 3,000,000.00	Stores estimated number of buyers.
1.3 QUAN	QUANT=1.30	Stores number each buyer will purchase.
95 PRICE	PRICE=95.00	Stores average unit price.
POTEN STO 0	POTENTI..= 370,500,000.00	Calculates total market size in dollars and stores the value for use in part 3.

Part 2. Your goal for the year is a 15% dollar share of this market. What must your yearly sales before discount be to meet this goal?

× 15 % =	55,575,000.00	Calculates dollar share to meet this goal.

Part 3. Realistically, your firm can achieve sales of only $40 million for the year. What share will you realize?

MAIN BUS %TOTL		Displays %TOTL menu.
RCL 0 TOTAL	TOTAL= 370,500,000.00	Stores total market size.
40000000 PART	PART= 40,000,000.00	Stores maximum sales.
%T	%TOTAL=10.80	Calculates dollar market share your firm can achieve.

Source: Philip Kotler, *Marketing Management: analysis, planning, and control* (Fifth Edition). Englewood Cliffs, N.J.: Prentice-Hall, 1984.

Sample Size for Estimating Population Mean

When performing market research, you typically can't talk to all of your potential market about their needs and opinions. Instead, a sample is selected. The formula below helps you determine how large a simple random sample should be to represent the population to the accuracy you desire.

Entering and Using the SSIZE Formula:

1. From the MAIN menu, press SOLVE to display the SOLVE menu.
2. Type in the SSIZE formula as follows:

   SSIZE=(ZNORM×SDEV÷ERROR)^2
3. Press CALC to verify the formula and display the custom menu.
4. Store three of the following variables:
   - Sample size in SSIZE.
   - Normal distribution Z value in ZNOR. (Note that for 95% confidence, Z=1.96; for 99% confidence, Z=2.58. Refer to a statistics book for more information.)
   - Population standard deviation in SDEV.
   - Maximum acceptable difference between the sample mean and the population in ERROR.
5. Press the menu key to calculate the unknown variable.

Example: Part 1. You are investigating radio advertising in your city. Prior research indicated that the standard deviation for the number of hours per week that adults listen to the radio is 2.3 hours. If you wish to estimate the average number of hours that adults listen to the radio by taking a simple random sample, how many adults must you sample to be 95% confident that your estimate is within .5 hour of the true average number of hours?

Start from the SSIZE custom menu.

Keys:	Display:	Description:
1.96 ZNOR	ZNORM=1.96	Stores normal distribution for 95% confidence.
2.3 SDEV	SDEV=2.30	Stores standard deviation.
.5 ERROR	ERROR=0.50	Stores error.
SSIZE	SSIZE=81.29	Calculates size of the sample needed.

Part 2. Suppose you want your error to be only .25 hours. Calculate sample size.

.25 ERROR	ERROR=0.25	Stores the error.
SSIZE	SSIZE=325.15	Calculates sample size.

A

Conserving Memory

The formulas in this book are intended to provide useful solutions. The variable names are several characters long to be meaningful to you. The formulas change a percent to a decimal so you don't have to remember to do it. These features make the formulas longer and take up more memory. Here are a few hints to help you conserve memory, should you need to:

- Shorten variable names. Variables are named to be as intuitive as possible. One way to save memory is to use single letter variable names.
- Delete division by 100. The formulas using a percent are written so you enter the percentage rather than the decimal value. Examples of this are tax rate as a percent, discount rate as a percent, or interest rate. If you do delete division by 100 from the formulas, remember to divide the percent by 100, or enter the percent and press [%], before storing the value in the variable.
- Delete variables for other formulas. When the SOLVE menu is displayed and you press ■ CLEAR ALL VARS, the variables are erased, giving you more usable memory. (If you select BOTH instead of VARS, all formulas and their variables will be gone.)
- Delete individual formulas. When the SOLVE menu is displayed, move the pointer to the formula you want to delete, and press DELET BOTH.

Working With Your Business Consultant Professional Calculator

The *Marketing Consultant* contains a variety of applications, formulas and keystrokes to help you solve the specialized problems of your profession.

- Markup Calculations
- Setting a Sales Price
- Forecasting Sales Based on History
- Forecasting Sales Using Simple Moving Average
- Forecasting Sales of Accessories
- Revising Your Forecast to Reflect Current Market Conditions
- Planning Advertising Expenditures
- Stockturn or Inventory Turnover Rate
- Break-even Analysis
- Estimating the Financial Feasibility of New Product Ideas
- Return on Investment
- Elasticity of Demand
- Sales Analysis
- Total Market Size Potential
- Sample Size for Estimating Population Mean

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