CHAPTER - III

PLAN AND PROCEDURE

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CHAPTER - III

PLAN AND PROCEDURE

Expected change in behaviour is called Education. In this Education process teaching and learning is included. Now it is agreed that, Education should be child centred. At present the teaching learning process is dominated by the teachers activities. That is to say the teacher is active and the students most of the time are passive. This has led to dissatisfaction both among teachers and students. Researchers have attempted to design the teaching learning process in such a way that it is dominated by the child rather than by teacher. This approach lays more emphasis on the child in the teaching learning process. Because of this, different types of instructional material were developed.

These instructional materials although they made the child an active learner but the instruction was not child centred. That is to say each child is different and, therefore a different type of instructional material be developed with the help of which the child can learn to its maximum capacity within less time compared to traditional methods.

This difficiency to a great extent can be met with the help of the use of computers in teaching learning process. The computers have vast memory, speed and can be used in any manner one likes. It can work without any error as an obedient servant. Majority of studies (Ann 1987) Millar (1988) Weaver (1987) Khot (1992) reported that computer Aided instruction could develop the achievement of students. Yet it may not be considered as a generalised statement. Therefore students achievement is taken into consideration in this study. This is

because in the absence of the duration of the class and the subject, a generalised statement can not be made. Further even the studies did not employ the common design.

In Past periods of innovation Education of young people has been fraught with fads, fetishes, and formulisms. So that they will not blindly endorse not needlessly reject computer technology. Teachers need to be knowledgeble of its potential and applications.

This chapter can be divided into following sections....

(A) Method of procedure.

(B) About the BASIC langauge.

(C) Programme description and preparation.

(D) Print out of floppy.

A METHOD OF PROCEDURE

SAMPLE AND SUBJECT

In this research randomaly selected sixty Adolescents of VIII standard English medium school were taken into consideration. Sixty students of Irwin Christian High School, Kolhapur were selected.

There are two divisions of eighth standard students. Divisions are made randomly Viz. VI.I D and VIII E.

Thirty students from VIII E were selected randomly and were taught by traditional teaching method in school by their regular teacher.

Thirty students from VIII D were taken up for experimentations. Those were taught by using a floppy consisting of contents of eighth & ninth chapters of Eighth standard Algebra. They were taught in the

computer centre in their school. Experimental group was taught by CAI method before teaching the same topic in their school by traditional method.

All the subjects were drawn from urban area only. Equal number of boys and girls were selected in Experimental group and in control group. All students belonged to English medium of Eighth standard.

The study was experimental in nature. An experiment involves the comparison of the effects of a particular treatment with that of a different treatment or of no. treatment. In a simple experiment reference is usually made to an Experimental Group and to a Control Group. These groups are equated as nearly as possible. The experimental group is exposed to the influence of the factor under consideration and the control group is not. Observations are then made to determine what difference appears or what change or modification occurs in the experimental as constructed with the control group.

For both the groups the same pre-test and post-test in the form of paper pencil test was administrated.

PRE TEST

Pre test was administrated before learning the topic and it was paper pencil in nature. It was administrated for judging the previous knowledge of the students regarding these two topics. Time given for solving the questions was one hour. It was of 40 marks. It was objective type in nature. There were six types of objective types of questions namely.

Q.No. 1. - Fill in the Blanks.

Q.No. 2. - Define the term and give one example

Q.No. 3. - Match the following.

Q.No. 4. - Do as directed.

Q.No. 5. - Simplify.

Q.No. 6. - Find out like terms.

Pre test was shown to the Matematics teachers of the English medium schools and suggestions and opinions were taken into consideration.

Pre test was conducted by the researcher with the assistance of the teachers in the school. For both the groups pre test was administrated at the same time.

POST TEST

Post Test was administrated after learning the topic. For two groups post test was administrated at different time.

Experimental group was taught by CAI method and soon after Post test was conducted.

Control group was taught by traditional method by the teachers in the school in Febrauary and March 1994 and soon after in March 1994 post test was administrated on them.

It was administrated for judging knowledge got by students regarding the topics by using that particular method. Time gtiven for the test is of one hour. It is of forty marks. It consists of three objective type questions viz.

Q.No.I. - Fill in the blanks.

Q.No.II. - Expand the following

Q.No.III. - Factorize the following

The test was of paper pencil type. Post test was conducted by the researcher with the assistance of teachers in the school.

The data obtained from pre-test and post test at the regular class room method and computer Aided instruction was analysed by using suitable statistical techniques like mean, S.D. t test, f test etc.

ABOUT BASIC LANGUAGE

A computer performs operations in response to data and instructions. This is done with the help of a programme. A programme is a list of steps that instruct the computer on how to solve a problem.

BASIC (Beginner's All Purpose Symbolic Instructional Code) is composed of easily understandable statements and commands and is one of the simplest programming language. BASIC provides an interactive human machine relationship by allowing direct communication with the processor. It is a conversational programming language that uses simple English like statement and familiar mathematical notations to perform an operation.

BASIC Language

Like all programming language BASIC has a grammer and a vocabulary.

A complete set of BASIC definitions is given below.

I. Alphamerical characters.

(a) Digits 0,1,2,3,4,5,6,7,8,9.

(b) Letters A to Z.

(c) Special characters. $ £ * , ( ) . + , − , / , = \ > , < , // ↑ , ⌒ , ≠ , & etc.

II. Statement numbers 1 to 4 digits.

III. Strings : Any string of alphanumeric character included in single or double quotation marks.

IV. Constant : A string of digits, signed or unsigned (positive) with or without a decimal point. There are three types of constants.

(1) Numercial constants.

(2) Integer constants.

(3) String constants.

V. Varibles.

(a) Simple variable. An alphabet or an alphabet followed by a digit.

(b) Subscripted variables. A variable in the case of a single subscripted variable e.g. A (1) and a variable in case of a double subscripted variable e.g. A (1,3). There are three types of variables.

1. Simple numerical variables.
2. Integer variables.
3. String variables.

VI. Operations - Five basic arithmetic operations are permitted in BASIC.

(a) Addition (+)

(b) Subtraction (-)

(c) Multiplication (*)

(d) Division (/)

(e) Exponentiation (* *) or ↑

In BASIC programme data can be supplied by INPUT, READ, DATA, RESTORE and FILE statements. File statements permit storage of data outside the programme.

In BASIC programme execution is done in the ascending order of line numbers, unless instructed otherwise by control statements. The normal sequence of statement execution can be altered by means of control statements e.g. GOTO. If then and if goto statements, for and next statements, etc.

PROGRAMME DESCRIPTION AND PREPARATION

Name of the Programme Project I :

To start the programme.....

Insert Floppy in Drive A :

A › BASICA

Load Project I

OK

Press F2 or RUN

Sound for five times and name of programmer will appear on screen.

Press number one & Enter Key to continue.

Name of Project, Name of Programmer, Name of guide will appear on screen.

Press number one & Enter key to continue.

All the instructions for the students regarding running the, programme will appear on screen.

Always press number one and Enter Key to Continue the Programme.

In programme there are some objective type questions. For each question four alternatives are given. Student should choose proper alternative and should Press the number representing that alternative and then press enter key.

If the alternative chosen is correct then an encouragement statement comes on screen e.g. very good Press 1 to continue and programme is continued and if the alternative chosen is wrong the remark of 'Wrong option, please try again' comes on screen. Same remark is getting on screen till student press correct answer.

There are some formulae which should be learnt by heart by students. Those formulae are given in blinking manner in bold type and in rectangle.

Some solved examples are given and number of examples are given to solve. On the next screen answers of the examples are given for checking. It is expected that students should solve those examples in their note book and then only see the answers on computer screen.

Steps used in preparing programme.

1. Researcher first of all analysed and studied the content of the text in VIII and IX chapter of Eighth standard Algebra.

2. Researcher thought about the output of the content.

3. Researcher then studied BASIC language, facilities provided by

this language and limitations of BASIC language.

4. Researcher then make a list of all statements which should be used in programme. Different programmes are prepared and then programmes are murged in proper manner.

5. Researcher try to use graphics facility, sound facility, facility of blinkingness to make the programme attractive.

6. Researcher used following commands 'Locate' 'Print' 'Go TO' 'CLS' 'If then' 'for the next loop' etc.

Programme is as follows :


```
10  CLS:KEY OFF:SCREEN 1
20  FOR I=1 TO 5
30  SOUND 262, 9
40  SOUND 294, 9
50  SOUND 330, 9
60  SOUND 349, 9
70  SOUND 392, 9
80  SOUND 440, 9
90  SOUND 494, 9
100 SOUND 523, 9
110  LOCATE 10,6 :PRINT "V. G. PARANJAPE PRESENTS"
120  LOCATE 12,6 : PRINT "TEACHING SOFTWARE FOR LEARNING ALGEBRA"
130  FOR K=1 TO 500:NEXT K:NEXT I
140 LOCATE 25,15:INPUT "PRESS 1 TO CONTINUE";K$
150 IF K$<"1" OR K$>"1" THEN GOTO 180 ELSE  160
160 IF K$="1" THEN GOTO 170
170 SCREEN 2:SCREEN 0:GOTO 190
180 END
190 CLS
200 LOCATE 5,50
210 PRINT "A TEXT BASED SOFTWARE IN TEACHING - LEARNING"
220 LOCATE 6,50
230 PRINT "-----------------------------------------"
240 LOCATE 10,50
250 PRINT "LEARNING ALGEBRA FOR EIGHTH STANDARD ADOLESCENTS"
260 LOCATE 15,1
270 PRINT "MADE BY "
280 LOCATE 16,1
290 PRINT "V. G. PARANJAPE"
300 LOCATE 17,1
310 PRINT "M.Sc.M.Ed.D.P.E.DIPLOMA IN BASIC"
320 LOCATE 15,40:PRINT "    GUIDE -"
330 LOCATE 16,40:PRINT "DR. M.S. PADMINI"
340 LOCATE 17,40:PRINT "DEPARTMENT OF EDUCATION"
350 LOCATE 18,40:PRINT "SHIVAJI UNIVERSITY"
360 LOCATE 19,40:PRINT "KOLHAPUR"
370 LOCATE 23,50
380 INPUT "PRESS 1 TO CONTINUE";A$
390 IF A$<"1" OR A$>"1" THEN GOTO 410 ELSE 400
400 IF A$="1" THEN GOTO 510
410 PRINT "W R O N G   O P T I O N "
420 PRINT "Please try again"
430 GOTO 370
440 KEY OFF:CLS:SCREEN 1:COLOR 8,0
450 PRINT "Distance between two points":PRINT
450 PRINT "Distance between two points":PRINT
460 PRINT "A and B is 16 cms.":PRINT :PRINT "L(AB) = 16"
470 LOCATE 13,12:PRINT "A":LOCATE 13,34:PRINT "B"
480 LINE (100,100)-(260,100),1:LOCATE 25,15
490 INPUT "PRESS 1 TO CONTINUE";C666$:IF C666$="1" THEN 700
500 SCREEN 2:SCREEN 0:GOTO 600
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500 SCREEN 2:SCREEN 0:GOTO 60C
510 CLS:PRINT
520 PRINT "PLEASE CAREFULLY READ THE ABOVE INSTUCTIONS TO STUDY THIS LESSON"
530 PRINT "-------------------------------------------------------------------"
540 PRINT:PRINT "1> I the computer  will now teach you ALGEBRA"
550 PRINT "2> You have to read caryfully before pressing any keys"
560 PRINT "3> Every time you have to PRESS 1 and ENTER key from keyboard"
570 PRINT "   to go to next page ."
580 PRINT "4> If I am asking you some  QUESTION first you have to calculate"
590 PRINT "   in your notebook so be ready with a notebook & pen..."
600 PRINT "   After calculating in notebook you have to choose the correct"
610 PRINT "   option out of four options given (1 or 2 or 3 or 4)"
620 PRINT "5> If you want to start again or want to see the last page again"
630 PRINT "   PRESS CONTROL key with C followed by pressing "F2" key"
640 PRINT "6> I hope these instructions are clear to you , if you have any"
650 PRINT "   problems ask the present teacher before pressing any keys"
660 PRINT
670 PRINT "WISH YOU ALL THE BEST FROM ME"
680 LOCATE 25,50:INPUT "PRESS 1 TO CONTINUE";C1000$
690 IF C1000$<"1" OR C1000$>"1" THEN PRINT "WRONG OPTION":GOTO 680 ELSE 691
691 IF C1000$="1" THEN GOTO 440
700 CLS:SCREEN 1:COLOR 8,0
710 PRINT "Now see this line segment carefully":PRINT
720 PRINT "C and D are the points in line AB":PRINT
730 LOCATE 14,12:PRINT "A":LOCATE 14,34:PRINT "B"
740 LOCATE 14,18:PRINT "C":LOCATE 14,27:PRINT "D"
750 LINE (100,100)-(140,100),1
760 LINE (142,100)-(190,100),1
770 LINE (190,100)-(210,100),1
780 LINE (212,100)-(260,100),1
790 LOCATE 25,15:INPUT "PRESS 1 TO CONTINUE";C25$:IF C25$="1" THEN 800
800 SCREEN 2:SCREEN 0
810 GOTO 820
820 CLS :LOCATE 5,1
830 PRINT "Distance between two points A and B is 16 cm is denoted as :"
840 PRINT
850 PRINT "                    L(AB) = 16"
860 PRINT
870 PRINT "Suppose from this line segment AB, a triangle is formed by"
880 PRINT :PRINT
890 PRINT "bending at point C & D on it as shown in above figure."
900 PRINT:PRINT
910 LOCATE 23,50:INPUT "Press 1 to continue";C17$
920 IF C17$<"1" OR C17$>"1" THEN GOTO 940 ELSE 930
 30 IF C17$="1" THEN GOTO 980
 40 PRINT "W R O N G  O P T I O N"
 50 PRINT "Please try again"
 60 ] PRINT
 70 GOTO 910
 80 CLS:SCREEN 1:COLOR 8,0
 90 PRINT "A TRIANGLE IS FORMED -":PRINT :PRINT :LOCATE 3,19
000 PRINT "A":LOCATE 3,22:PRINT "B"
010 LINE (100,120)-(220,120),1:LOCATE 17,12:PRINT "C"
020 LINE (220,120)-(160,30),1:LOCATE 17,29:PRINT "D"
030 LINE (160,30)-(100,120),1:LOCATE 25,15
040 INPUT "PRESS 1 TO CONTINUE";C27$:IF C27$="1" THEN 1050
050 SCREEN 2:SCREEN 0:GOTO 1060
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1050 SCREEN 2:SCREEN 0:GOTO 1060
1060 CLS :PRINT
1070 PRINT "Now there is a Question for you,Try to answer....."
1080 PRINT
1090 PRINT "Q1: If L(AB) = 5 cms"
1100 PRINT "       L(BC) = 6 cms"
1110 PRINT "       L(CA) = 5 cms"
1120 PRINT "    are the seperate lengths of three sides of a triangle."
1130 PRINT "    What is the sum of three sides of the triangle ?":PRINT :PRINT
1140 PRINT "First calculate the answer in your notebook & after that":PRINT
1150 PRINT "Choose your answer from the following choices :-"
1160 PRINT
1170 PRINT "1> 12 cms"
1180 PRINT "2> 16 cms"
1190 PRINT "3> 14 cms"
1200 PRINT "4> 20 cms"
1210 PRINT
1220 INPUT "Please enter your choice : ";A$
1230 IF A$ <"1" OR A$>"4" GOTO 1250 ELSE 1240
1240 IF A$="1" OR A$="3" OR A$="4" THEN GOTO 1250 ELSE 1300
1250 CLS:PRINT "Sorry !":PRINT "W R O N G  A N S W E R "
1260 PRINT "Please try again":GOTO 1080
1270 PRINT
1280 PRINT
1290 PRINT :GOTO 1090
1300 IF A$ = "2" THEN GOTO 1310
1310 PRINT "GOOD ! Your answer is right..... Go Ahead....."
1320 LOCATE 23,50
1330 INPUT "PRESS 1 TO CONTINUE";A$
1340 IF A$="1" THEN GOTO 1350
1350 CLS:SCREEN 1:COLOR 8,0:PRINT
1360 FOR I = 1 TO 20:CLS
1370 PRINT "_____":PRINT
1380 PRINT "SUM  OF  LENGTHS  OF THE  THREE SIDES "
1390 PRINT "OF A TRIANGLE IS CALLED ITS PERIMETER"
1400 PRINT "_____":PRINT :LOCATE 12,10
1410 FOR K = 1 TO 500:NEXT K:NEXT I
1420 PRINT "A":LOCATE 16,6:PRINT "B":LOCATE 16,18:PRINT "C"
1430 LINE (50,125)-(130,125),1:LINE (130,125)-(80,100),1
1440 LINE (80,100)-(50,125),1:PRINT
1450 PRINT "_____":PRINT
1460 PRINT "PERIMETER OF TRIANGLE ABC"
1470 PRINT
1480 PRINT "  = L(AB) + L(BC) + L(CA)"
1490 PRINT "_____":LOCATE 25,15
1500 INPUT "PRESS 1 TO CONTINUE";C28$:IF C28$="1" THEN 1510
1510 SCREEN 2:SCREEN 0:GOTO 1520
1520 CLS
1530 PRINT
1540 PRINT :PRINT "Try to remember this DEFINITION by heart"
1550 PRINT:PRINT
1560 FOR I=1 TO 20:CLS
1570 PRINT "_____"
1580 PRINT
1590 PRINT "  SUM OF THE THREE SIDES OF A TRIANGLE IS CALLED ITS PERIMETER
1600 PRINT "_____"
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1600 PRINT "_____"
1610 FOR K=1 TO 500:NEXT K:NEXT I
1620 PRINT
1630 PRINT
1640 PRINT:PRINT
1650 PRINT
1660 PRINT "According to the above figure we can say that :- .
1670 PRINT
1680 PRINT
1690 PRINT " _____"
1700 PRINT "                                                                "
1710 PRINT "   PERIMETER OF TRIANGLE ABC = L(AB) + L(BC) + L(AC)    "
1720 PRINT " _____"
1730 LOCATE 23,50:INPUT "PRESS 1 TO CONTINUE";C18$
1740 IF C18$<"1" OR C18$>"1" THEN GOTO 1760 ELSE 1750
1750 IF C18$="1" THEN GOTO 1780
1760 PRINT "W R O N G  O P T I O N ":PRINT "Please try again"
1770 GOTO 1730
1780 CLS
1790 PRINT
1800 PRINT "Now there is a QUESTION for you "
1810 PRINT:PRINT "Q2: If length of the three sides of a triangle ABC are :-"
1820 PRINT "          L(AB) = L(BC) = L(AC) = X"
1830 PRINT
1840 PRINT "          What will be the perimeter of the triangle ABC ?":PRINT
1850 PRINT "First calculate the answer in your notebook & after that":PRINT
1860 PRINT "Please choose your answer from given options :-"
1870 PRINT
1880 PRINT "1> 4X"
1890 PRINT "2> 6X"
1900 PRINT "3> 3X"
1910 PRINT "4> 2X"
1920 PRINT
1930 INPUT "Now enter your choice <1-4> :";C1$
1940 IF C1$<"1" OR C1$>"4" THEN GOTO 2060 ELSE 1950
1950 IF (C1$="1") OR (C1$="2") OR (C1$="4") THEN GOTO 2060 ELSE 1960
1960 IF C1$="3" THEN 1970
1970 PRINT "VERY GOOD ! Go ahead........"
1980 LOCATE 23,50:INPUT "PRESS 1 TO CONTINUE";C31$
1990 IF C31$<"1" OR C31$>"1" THEN 2000 ELSE 2010
2000 LOCATE 24,15:PRINT "W R O N G  O P T I O N":GOTO 1980
2010 IF C31$="1" THEN 2020
2020 GOTO 2090
2030 PRINT
2040 IF C1$ = "1" OR C1$="2" OR C1$="4" THEN GOTO 2060
2050 PRINT "Please try again":GOTO 1930
2060 PRINT "Sorry !   W R O N G  A N S W E R"
2070 PRINT
2080 PRINT "Please try again":GOTO 1860
2090 CLS:PRINT
2100 PRINT "Now here there is QUESTION for you"
2110 PRINT
2120 PRINT "Q3: If L(AB) = 8 , L(BC) = 9 and L(AC) = 7"
2130 PRINT
2140 PRINT "    What is the perimeter of triangle ABC ?"
2150 PRINT:PRINT
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2150 PRINT:PRINT
2160 PRINT "First you calculate in your notebook and after that":PRINT
2170 PRINT "Choose your answer from given options :-"
2180 PRINT
2190 PRINT "1> 24"
2200 PRINT "2> 26"
2210 PRINT "3> 20"
2220 PRINT "4> 25"
2230 PRINT
2240 INPUT "Enter your choice <1-4> :";C3$
2250 IF C3$<"1" OR C3$>"4" THEN GOTO 2350 ELSE 2260
2260 IF (C3$="2") OR (C3$="3") OR (C3$="4") THEN GOTO 2350 ELSE 2270
2270 IF C3$ = "1" THEN GOTO 2280
2280 PRINT "VERY GOOD ! Go ahead........"
2290 LOCATE 23,50:INPUT "Press 1 to continue";C19$
2300 IF C19$<"1" OR C19$>"1" THEN GOTO 2320 ELSE 2310
2310 IF C19$="1" THEN GOTO 2370
2320 PRINT "W R O N G  O P T I O N "
2330 PRINT "Please try again"
2340 GOTO 2290
2350 PRINT "Sorry !   W R O N G  A N S W E R"
2360 GOTO 2170
2370 CLS:PRINT :PRINT "Please learn this definition by heart for 2 minutes :-"
2380 PRINT
2390 FOR I=1 TO 20:CLS
2400 PRINT "_____________________________________________________________________"
2410 PRINT
2420 PRINT "PERIMETER OF TRIANGLE IS DEFINED AS SUM OF THE LENGTHS OF 3 SIDES"
2430 PRINT "_____________________________________________________________________"
2440 FOR K=1 TO 500:NEXT K:NEXT I
2450 PRINT
2460 PRINT
2470 PRINT
2480 PRINT "   A     C          D      E          B"
2490 PRINT "   .-----.----------.------.----------."
2500 PRINT "      3        5       3        5"
2510 PRINT
2520 PRINT " We know that"
2530 PRINT
2540 PRINT " L(AB) = L(AC) + L(CD) + L(DE) + L(EB)
2550 PRINT
2560 PRINT " That is"
2570 PRINT
2580 PRINT " L(AB) = 3 + 5 + 3 + 5"
2590 PRINT
2600 PRINT " L(AB) = 16"
2610 PRINT:LOCATE 23,50:INPUT "PRESS 1 TO CONTINUE";C20$
2620 IF C20$<"1" OR C20$>"1" THEN GOTO 2640 ELSE 2630
2630 IF C20$="1" THEN GOTO 2660
2640 PRINT "W R O N G  O P T I O N ":PRINT "Please try again"
2650 GOTO 2610
2660 CLS:SCREEN 1:COLOR 8,0:PRINT "This is a line segment AB"
2670 PRINT "It is divided into 4 parts as shown":LOCATE 12,1
2680 PRINT "Suppose segment AB is bent at C,D & E":LOCATE 13,1
2690 PRINT "Then a RECTANGLE is formed as shown"
2700 LINE (70,75)-(100,75),1
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2700 LINE (70,75)-(100,75),1
2710 LINE (102,75)-(150,75),1
2720 LINE (152,75)-(200,75),1
2730 LINE (202,75)-(230,75),1
2740 LINE (70,150)-(120,150),1
2750 LINE (120,150)-(120,120),1
2760 LINE (120,120)-(70,120),1
2770 LINE (70,120)-(70,150),1:LOCATE 9,9:PRINT "A":LOCATE 9,13:PRINT "C"
2780 LOCATE 9,19:PRINT "D":LOCATE 9,25:PRINT "E":LOCATE 9,29:PRINT "B"
2790 LOCATE 20,10:PRINT "A":LOCATE 19,8:PRINT "B"
2800 LOCATE 20,16:PRINT "C":LOCATE 15,16:PRINT "D":LOCATE 15,10:PRINT "E"
2810 LOCATE 25,15:INPUT "PRESS 1 CONTINUE";C30$
2820 IF C30$<"1" OR C30$>"1" THEN GOTO 2840 ELSE 2830
2830 IF C30$="1" THEN 2870
2840 PRINT "W R O N G   O P T I O N"
2850 PRINT "Please try again"
2860 GOTO 2810
2870 SCREEN 2:SCREEN 0
2880 CLS:PRINT :PRINT :PRINT
2890 PRINT " Now suppose segment AB is bent at C,D,E "
2900 PRINT
2910 PRINT " Then a RECTANGLE ACDE is formed as shown in above figure :-"
2920 PRINT
2930 PRINT "        B                              E"
2940 PRINT "     A  ¦~~~~~~~~~~~~~~~~~~~~~~~~~~~~¦   "
2950 PRINT "        ¦                              ¦"
2960 PRINT "        ¦                              ¦"
2970 PRINT "        ¦                              ¦"
2980 PRINT "        ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~"
2990 PRINT "        C                              D    "
3000 PRINT:LOCATE 23,50:INPUT "PRESS 1 TO CONTINUE";C21$
3010 IF C21$<"1" OR C21$>"1" THEN GOTO 3030 ELSE 3020
3020 IF C21$="1" THEN GOTO 3060
3030 PRINT "W R O N G  O P T I O N "
3040 PRINT "Please try again"
3050 GOTO 3000
3060 CLS:PRINT:PRINT "Now there is Question for you"
3070 PRINT
3080 PRINT :PRINT
3090 PRINT "Q4:If L(AC) = 3 cms"
3100 PRINT "      L(CD) = 5 cms"
3110 PRINT "      L(DE) = 3 cms"
3120 PRINT "      L(EA) = 5 cms"
3130 PRINT "    What will be the perimeter of rectangle ACDE ?"
3140 PRINT
3150 PRINT "Please choose your answer from the given options :-"
3160 PRINT
3170 PRINT "1> 14"
3180 PRINT "2> 17"
3190 PRINT "3> 16"
3200 PRINT "4> 12"
3210 PRINT
3220 INPUT "ENTER YOUR CHOICE <1-4> :";C4$
3230 IF C4$<"1" OR C4$>"4" THEN GOTO 3310 ELSE 3240
3240 IF (C4$="1") OR (C4$="2") OR (C4$="4") THEN GOTO 3310 ELSE 3250
3250 IF C4$="3" THEN GOTO 3260  :PRINT
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3260 PRINT "VERY GOOD ! Go ahead........"
3270 LOCATE 23,50:INPUT "PRESS 1 TO CONTINUE";C32$
3280 IF C32$<"1" OR C32$>"1" THEN 3290 ELSE 3300
3290 LOCATE 22,50:PRINT "W R O N G  O P T I O N":GOTO 3270
3300 IF C32$="1" THEN GOTO 3350
3310 PRINT
3320 CLS:PRINT "S O R R Y !"
3330 PRINT "W R O N G  O P T I O N "
3340 PRINT "Please try again":GOTO 3090
3350 CLS:PRINT:PRINT
3360 PRINT "Please learn this definition by heart -":PRINT :PRINT
3370 FOR I=1 TO 20:CLS
3380 PRINT "_____________________________________________________________________":PRINT
3390 PRINT "PERIMETER OF RECTANGLE IS DEFINED AS THE SUM OF ALL THE SIDES"
3400 PRINT "_____________________________________________________________________"
3410 FOR K=1 TO 500:NEXT K:NEXT I
3420 PRINT:PRINT
3430 PRINT "that is"
3440 PRINT:PRINT
3450 PRINT "_____________________________________________________"
3460 PRINT "                                                     "
3470 PRINT "  PERIMETER OF RECTANGLE = 2(LENGTH) + 2(BREADTH)   "
3480 PRINT "_____________________________________________________"
3490 PRINT
3500 LOCATE 23,50:INPUT "PRESS 1 TO CONTINUE";C33$
3510 IF C33$<"1" OR C33$>"1" THEN GOTO 3520 ELSE 3530
3520 LOCATE 22,50:PRINT "W R O N G  O P T I O N":GOTO 3500
3530 IF C33$="1" THEN GOTO 3540
3540 CLS
3550 PRINT "Now here there is a question for you "
3560 PRINT
3570 PRINT "Q5: If  L=6 and B=1,"
3580 PRINT "    What is the perimeter of the this rectangle ?"
3590 PRINT
3600 PRINT "Choose your answer from given options :-"
3610 PRINT
3620 PRINT "1>14"
3630 PRINT "2>15"
3640 PRINT "3>13"
3650 PRINT "4>12"
3660 PRINT
3670 INPUT "ENTER YOUR CHOICE <1-4>";C5$
3680 IF C5$<"1" OR C5$>"4" THEN GOTO 3730 ELSE 3690
3690 IF (C5$="2") OR (C5$="3") OR (C5$="4") THEN GOTO 3730 ELSE 3700
3700 PRINT
3710 PRINT "VERY GOOD ! Go ahead........"
3720 GOTO 3760
3730 PRINT
3740 PRINT "WRONG OPTION ! Please try again"
3750 GOTO 3610
3760 CLS:SCREEN 1:COLOR 8,0:PRINT
3770 PRINT "In the above figure we see"
3780 PRINT "a RECTANGLE of length L=4, breadth B=2"
3790 PRINT "is  divided into 8 parts in terms of"
3800 PRINT
```

```
3810 PRINT "UNIT SQUARES'
3820 LINE (100,150)-(125,150),1
3830 LINE (127,150)-(150,150),1
3840 LINE (152,150)-(175,150),1
3850 LINE (177,150)-(205,150),1
3860 LINE (100,125)-(125,125),1
3870 LINE (127,125)-(150,125),1
3880 LINE (152,125)-(175,125),1
3890 LINE (177,125)-(200,125),1
3900 LINE (100,100)-(125,100),1
3910 LINE (127,100)-(150,100),1
3920 LINE (152,100)-(175,100),1
3930 LINE (177,100)-(200,100),1
3940 LINE (100,150)-(100,125),1
3950 LINE (100,125)-(100,100),1
3960 LINE (127,150)-(127,125),1
3970 LINE (127,125)-(127,100),1
3980 LINE (152,150)-(152,125),1
3990 LINE (177,150)-(177,125),1
4000 LINE (177,125)-(177,100),1
4010 LINE (152,125)-(152,100),1
4020 LINE (202,150)-(202,125),1
4030 LINE (202,125)-(202,100),1 :KEY OFF
4040 LOCATE 23,15:INPUT "PRESS 1 TO CONTINUE";C34$
4050 IF C34$<"1"  OR C34$>"1" THEN GOTO 4070 ELSE 4060
4060 IF C34$="1" THEN GOTO 4100
4070 PRINT "W R O N G   O P T I O N"
4080 PRINT "Please try again"
4090 GOTO 4040
4100 SCREEN 2:SCREEN 0:GOTO 4110
4110 CLS:SCREEN 1:COLOR 8,0:PRINT :PRINT
4120 PRINT "The following figure is displaying"
4130 PRINT
4140 PRINT " a UNIT SQUARE"
4150 PRINT "    ___________"
4160 LINE (175,125)-(200,125),1
4170 LINE (200,125)-(200,100),1
4180 LINE (200,100)-(175,100),1
4190 LINE (175,100)-(175,125),1
4200 LOCATE 25,15:INPUT "PRESS 1 TO CONTINUE";C36$
4210 IF C36$="1" THEN GOTO 4220
4220 SCREEN 2:SCREEN 0:GOTO 4230
4230 CLS : PRINT
4240 PRINT                          4
4250 PRINT "          A  ~~~~~~~~~~~~~~~~~~~~~~~~~~~ D"
4260 PRINT "             |     |     |     |     |"
4270 PRINT "          2  ~~~~~~~~~~~~~~~~~~~~~~~~~~~"
4280 PRINT "             |     |     |     |     |"
4290 PRINT "          B  ~~~~~~~~~~~~~~~~~~~~~~~~~~~ C"
4300 PRINT
4310 PRINT
4320 PRINT " In the above figure  we see a rectangle of length L=4 ,"
4330 PRINT
4340 PRINT " breadth B=2 is divided into 8 parts in terms of UNIT SQUARE"
4350 PRINT
```

```
4360 PRINT "The following figure is displaying a  UNIT SQUARE : "
4370 PRINT
4380 PRINT
4390 PRINT "                ~~~~~~~~"
4400 PRINT "                !      !"
4410 PRINT "                ~~~~~~~~"
4420 PRINT
4430 KEY OFF : LOCATE 25,15:INPUT "PRESS 1 TO CONTINUE";C38$
4440 IF C38$<"1"  OR C38$>"1" THEN GOTO 4460 ELSE 4450
4450 IF C38$="1" THEN GOTO 4500
4460 PRINT "W R O N G   O P T I O N"
4470 PRINT "Please try again"
4480 GOTO 4430
4490 PRINT
4500 CLS:PRINT :PRINT
4510 PRINT "Now there is a QUESTION  for you , Try to answer ...."
4520 PRINT
4530 PRINT "Q6: How many unit squares can be filled in above  rectangle ABCD ?"
4540 PRINT
4550 PRINT "Please choose your answer from given options :-"
4560 PRINT
4570 PRINT "1> 8"
4580 PRINT "2> 9"
4590 PRINT "3> 10"
4600 PRINT "4> 7"
4610 PRINT
4620 INPUT "Enter your choice <1-4> :";C7$
4630 IF C7$<"1" OR C7$>"4" THEN GOTO 4740 ELSE 4640
4640 IF C7$="2" OR C7$="3" OR C7$="4" THEN GOTO 4750 ELSE 4650
4650 IF C7$="1" THEN GOTO 4660
4660 PRINT
4670 PRINT "VERY GOOD ! Go Ahead ......."
4680 LOCATE 25,15:INPUT "PRESS 1 TO CONTINUE";C39$
4690 IF C39$<"1"  OR C39$>"1" THEN GOTO 4710 ELSE 4700
4700 IF C39$="1" THEN GOTO 4790
4710 PRINT "W R O N G   O P T I O N"
4720 PRINT "Please try again"
4730 GOTO 4680
4740 PRINT
4750 PRINT "W R O N G   O P T I O N "
4760 PRINT
4770 PRINT "Please try again"
4780 GOTO 4560
4790 CLS
4800 PRINT
4810 PRINT "Now try learn by heart"
4820 PRINT
4830 PRINT "Relation between number of unit  and length & breadth of triangle"
4840 PRINT
4850 PRINT "Number of unit squares = L * B"
4860 PRINT
4870 PRINT "Always when you see an * it is used here for multiplication"
4880 PRINT
4890 PRINT "_____________________________________________________":PRINT
4900 PRINT "   AREA OF RECTANGLE = LENGTH * BREADTH    "
```

```
4910 PRINT "_____"
4920 PRINT
4930 LOCATE 25,15:INPUT "PRESS 1 TO CONTINUE";C40$
4940 IF C40$<"1"  OR C40$>"1" THEN GOTO 4960 ELSE 4950
4950 IF C40$="1" THEN GOTO 4990
4960 PRINT "W R O N G   O P T I O N"
4970 PRINT "Please try again"
4980 GOTO 4930
4990 CLS:PRINT :PRINT "Now there is a QUESTION for you ,Try to answer .....
5000 PRINT
5010 PRINT "Q7: If length & breadth of a rectangle are L=6 and B=4"
5020 PRINT "    Find perimeter and area of the rectangle ?"
5030 PRINT
5040 PRINT "First solve in your notebook and after that "
5050 PRINT "Please choose your answer from given options :-"
5060 PRINT
5070 PRINT
5080 PRINT "1> AREA=23 , PERIMETER=20"
5090 PRINT "2> AREA=24 , PERIMETER=25"
5100 PRINT "3> AREA=24 , PERIMETER=20"
5110 PRINT "4> AREA=35 , PERIMETER=20"
5120 PRINT
5130 INPUT "ENTER YOUR CHOICE <1-4>:";C8$
5140 IF C8$<"1" OR C8$>"4" THEN GOTO 5250 ELSE 5150
5150 IF C8$="1" OR C8$="2" OR C8$="4" THEN GOTO 5250 ELSE 5160
5160 IF C8$="3" THEN GOTO 5170
5170 PRINT
5180 PRINT "VERY GOOD ! Go Ahead ....."
5190 LOCATE 25,15:INPUT "PRESS 1 TO CONTINUE";C41$
5200 IF C41$<"1"  OR C41$>"1" THEN GOTO 5220 ELSE 5210
5210 IF C41$="1" THEN GOTO 5300
5220 PRINT "W R O N G   O P T I O N"
5230 PRINT "Please try again"
5240 GOTO 5190
5250 PRINT
5260 PRINT "SORRY ! "
5270 PRINT "W R O N G   O P T I O N "
5280 PRINT "PLEASE TRY AGAIN"
5290 GOTO 4990
5300 CLS:PRINT
5310 PRINT
5320 PRINT "LEARN THE ABOVE FORMULA BY HEART :-"
5330 PRINT :PRINT
5340 PRINT "_____":PRINT
5350 PRINT "   AREA OF TRIANGLE = 1/2 (BASE) (HEIGHT)   "
5360 PRINT "_____"
5370 PRINT
5380 LOCATE 25,15:INPUT "PRESS 1 TO CONTINUE";C42$
5390 IF C42$<"1"  OR C42$>"1" THEN GOTO 5410 ELSE 5400
5400 IF C42$="1" THEN GOTO 5440
5410 PRINT "W R O N G   O P T I O N"
5420 PRINT "Please try again"
5430 GOTO 5380
5440 CLS:SCREEN 1:COLOR 8,0
5450 PRINT:PRINT "AREA OF TRIANGLE =":PRINT
```

```
5460 PRINT "1/2 ( BASE ) ( HEIGHT )":PRINT
5470 PRINT "BASE    = L(AB)":PRINT "HEIGHT = L(CD)"
5480 LOCATE 13,16:PRINT "C"
5490 LOCATE 20,16:PRINT "D":LOCATE 20,12:PRINT "A"
5500 LOCATE 20,21:PRINT "B"
5510 LINE (100,150)-(125,150),1:LINE (125,150)-(175,150),1
5520 LINE (175,150)-(125,100),1:LINE (125,100)-(100,150),1
5530 LINE (125,100)-(125,150),1
5535 LOCATE 23,1:PRINT "Draw figure in your notebook"
5540 LOCATE 25,15:INPUT "PRESS 1 TO CONTINUE";C155$
5550 IF C155$<"1"  OR C155$>"1" THEN GOTO 5570 ELSE 5560
5560 IF C155$="1" THEN GOTO 5600
5570 PRINT "W R O N G   O P T I O N"
5580 PRINT "Please try again"
5590 GOTO 5540
5600 SCREEN 2:SCREEN 0:GOTO 5610
5610 CLS:PRINT :PRINT "Now there is a QUESTION for you.Try to answer....."
5620 PRINT
5630 PRINT :PRINT "Q8: If L(AB)=8 L(AC)=6 L(CD)=4 L(CB)=3"
5640 PRINT "    Find perimeter and area of triangle ABC ?":PRINT
5650 PRINT "Try to first calculate in your notebook and after that"
5660 PRINT "Select your option from given choices :-"
5670 PRINT
5680 PRINT "1> PERIMETER = 17 , AREA = 16 "
5690 PRINT "2> PERIMETER = 19 , AREA = 18 "
5700 PRINT "3> PERIMETER = 17 , AREA = 19"
5710 PRINT "4> PERIMETER = 18 , AREA = 17"
5720 PRINT
5730 INPUT "ENTER YOUR CHOICE <1-4> :";C9$
5740 IF C9$<"1" OR C9$>"4" THEN GOTO 5850 ELSE 5750
5750 IF C9$="2" OR C9$="3" OR C9$="4" THEN GOTO 5850 ELSE 5760
5760 IF C9$="1" THEN GOTO 5770
5770 PRINT
5780 PRINT "VERY GOOD ! Go ahead ....."
5790 LOCATE 25,15:INPUT "PRESS 1 TO CONTINUE";C44$
5800 IF C44$<"1"  OR C44$>"1" THEN GOTO 5820 ELSE 5890
5820 PRINT "W R O N G   O P T I O N"
5830 PRINT "Please try again"
5840 GOTO 5790
5850 PRINT "SORRY ! "
5860 PRINT "W R O N G   O P T I O N "
5870 PRINT "Please try again"
5880 GOTO 5660
5890 CLS: PRINT :PRINT
5900 PRINT
5910 PRINT "Now there is one more QUESTION for you "
5920 PRINT "Q9: If C=8 , H=6"
5930 PRINT
5940 PRINT "First calculate the answer in your notebook "
5950 PRINT "and after that choose the answer from following set of options:-"
5960 PRINT
5970 PRINT "1> 23 square units"
5980 PRINT "2> 25 square units"
5990 PRINT "3> 24 square units"
6000 PRINT "4> 27 square units"
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6010 PRINT
6020 INPUT "ENTER YOUR CHOICE <1-4> NOW :";C10$
6030 IF C10$<"1" OR C10$>"4" THEN GOTO 6140 ELSE 6040
6040 IF C10$="1" OR C10$="2" OR C10$="4" THEN GOTO 6140 ELSE 6050
6050 IF C10$="3" THEN GOTO 6060
6060 PRINT
6070 PRINT "Exillent ! Go Ahead"
6080 LOCATE 25,15:INPUT "PRESS 1 TO CONTINUE";C45$
6090 IF C45$<"1"  OR C45$>"1" THEN GOTO 6110 ELSE 6100
6100 IF C45$="1" THEN GOTO 6190
6110 PRINT "W R O N G   O P T I O N"
6120 PRINT "Please try again"
6130 GOTO 6080
6140 PRINT
6150 PRINT "SORRY ! "
6160 PRINT "W R O N G  O P T I O N "
6170 PRINT "Please try again"
6180 GOTO 5960
6190 CLS:PRINT : PRINT
6200 CLS:SCREEN 1:COLOR 8,0
6210 PRINT:PRINT "Try to name the following figure -"
6220 LINE (25,175)-(75,175),1
6230 LINE (75,175)-(75,125),1
6240 LINE (75,125)-(25,125),1
6250 LINE (25,125)-(25,175),1
6260 LINE (35,165)-(85,165),1
6270 LINE (85,165)-(85,115),1
6280 LINE (85,115)-(35,115),1
6290 LINE (35,115)-(35,165),1
6300 LINE (25,125)-(35,115),1
6310 LINE (75,125)-(85,115),1
6320 LINE (25,175)-(35,165),1
6330 LINE (75,175)-(85,165),1
6340 LOCATE 23,15:INPUT "PRESS 1 TO CONTINUE";C50$
6350 IF C50$<"1"  OR C50$>"1" THEN GOTO 6370 ELSE 6360
6360 IF C50$="1" THEN GOTO 6400
6370 PRINT "W R O N G   O P T I O N"
6380 PRINT "Please try again"
6390 GOTO 6340
6400 SCREEN 2:SCREEN 0:GOTO 6420
6410 PRINT :PRINT :PRINT :PRINT
6420 CLS:PRINT :PRINT :PRINT "Yes , this is a CUBE"
6430 PRINT
6440 PRINT "Number of unit cubes that can be filled in a particalar"
6450 PRINT
6460 PRINT "solid is called as VOLUME of that solid."
6470 PRINT
6480 PRINT "Now try to learn  the above formulas carefully :-"
6490 PRINT
6500 LOCATE 25,15:INPUT "PRESS 1 TO CONTINUE";C60$
6510 IF C60$<"1"  OR C60$>"1" THEN GOTO 6530 ELSE 6520
6520 IF C60$="1" THEN GOTO 6560
6530 PRINT "W R O N G   O P T I O N"
6540 PRINT "Please try again"
6550 GOTO 6500
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```
6550 GOTO 6500
6560 FOR I=1 TO 20:CLS
6570 PRINT "_____________________________________________________":PRINT
6580 PRINT "   VOLUME OF RECTANGULAR PARALLELOPIPED = L * B * H   "
6590 PRINT "_____________________________________________________"
6600 FOR K=1 TO 500:NEXT K:NEXT I
6610 PRINT
6620 PRINT
6630 PRINT "_____________________________________________":PRINT
6640 PRINT "   TOTAL SURFACE AREA = 2LB + 2BH + 2LH    "
6650 PRINT "_____________________________________________"
6660 PRINT
6670 LOCATE 25,15:INPUT "PRESS 1 TO CONTINUE";C51$
6680 IF C51$<"1"  OR C51$>"1" THEN GOTO 6700 ELSE 6690
6690 IF C51$="1" THEN GOTO 6730
6700 PRINT "W R O N G   O P T I O N"
6710 PRINT "Please try again"
6720 GOTO 6670
6730 CLS:PRINT :PRINT "Now try to answer the above QUESTION"
6740 PRINT
6750 PRINT "Q 10:If L=5 , B=4 , H=2"
6760 PRINT "Find the VOLUME and TOTAL SURFACE AREA of the cube ?"
6770 PRINT
6780 PRINT "Have you tried in your notebook if not please try first "
6790 PRINT "Select your answer from given options :"
6800 PRINT
6810 PRINT "1> VOLUME                = 40"
6820 PRINT "   TOTAL SURFACE AREA = 76"
6830 PRINT "2> VOLUME                = 41"
6840 PRINT "   TOTAL SURFACE AREA = 45"
6850 PRINT "3> VOLUME                = 40"
6860 PRINT "   TOTAL SURFACE AREA = 77"
6870 PRINT "4> VOLUME                = 45"
6880 PRINT "   TOTAL SURFACE AREA = 76"
6890 PRINT
6900 INPUT "ENTER YOUR CHOICE <1-4> : ";C11$
6910 IF C11$<"1" OR C11$>"4" THEN GOTO 7020 ELSE 6920
6920 IF C11$="2" OR C11$="3" OR
6930 IF C11$="1" THEN GOTO 6940
6940 PRINT
6950 PRINT "GOOD ! Go Ahead ....."
6960 LOCATE 25,15:INPUT "PRESS 1 TO CONTINUE";C52$
6970 IF C52$<"1"  OR C52$>"1" THEN GOTO
6980 IF C52$="1" THEN GOTO 7060
6990 PRINT "W R O N G   O P T I O N"
7000 PRINT "Please try again"
7010 GOTO 6960
7020 PRINT "SORRY !"
7030 PRINT "W R O N G  O P T I O N"
7040 PRINT "Please try again"
7050 GOTO 6790
7060 CLS:PRINT :PRINT
7070 PRINT
7080 PRINT "Now one more QUESTION is there for you "
7090 PRINT "Q 11: Try to calculate"
7100 PRINT
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7110 PRINT "If L=B=H= a"
7120 PRINT "that is length = breadth = height = a"
7130 PRINT "Find volume of the cube ?"
7140 PRINT
7150 PRINT "Select your answer from above options :-"
7160 PRINT
7170 PRINT "1> Cube of a"
7180 PRINT "2> Square of a"
7190 PRINT "3> a"
7200 PRINT "4> 6a"
7210 PRINT
7220 INPUT "ENTER YOUR OPTION (1-4) :";C12$
7230 IF C12$<"1" OR C12$>"4" THEN GOTO 7340 ELSE 7240
7240 IF C12$="2" OR C12$="3" OR C12$="4" THEN GOTO 7340 ELSE 7250
7250 IF C12$="1" THEN GOTO 7260
7260 PRINT
7270 PRINT "VERY NICE ! Go ahead ....."
7280 LOCATE 25,15:INPUT "PRESS 1 TO CONTINUE";C53$
7290 IF C53$<"1"  OR C53$>"1" THEN GOTO 7310 ELSE 7300
7300 IF C53$="1" THEN GOTO 7390
7310 PRINT "W R O N G   O P T I O N"
7320 PRINT "Please try again"
7330 GOTO 7280
7340 PRINT
7350 PRINT "SORRY ! "
7360 PRINT "W R O N G  O P T I O N "
7370 PRINT "Please try again"
7380 GOTO 7150
7390 CLS
7400 PRINT "Now we are starting a new topic"
7410 PRINT
7420 PRINT "Are you ready to learn a few more formulas in ALGEBRA"
7430 PRINT
7440 PRINT "O. K. Go Ahead....."
7450 LOCATE 25,15:INPUT "PRESS 1 TO CONTINUE";C55$
7460 IF C55$<"1"  OR C55$>"1" THEN GOTO 7480 ELSE 7470
7470 IF C55$="1" THEN GOTO 7510
7480 PRINT "W R O N G   O P T I O N"
7490 PRINT "Please try again"
7500 GOTO 7450
7510 CLS:PRINT
7520 PRINT
7530 PRINT "EXPANSION OF PRODUCT OF BINOMIAL"
7540 PRINT "-------------------------------"
7550 PRINT
7560 PRINT
7570 PRINT
7580 PRINT
7590 PRINT "                                2                "
7600 PRINT "       (x+a)(x+b)        =    x  + ax + bx + ab
7610 PRINT "                                2   "
7620 PRINT "                           =    x  +
7630 LOCATE 25,40:INPUT "PRESS 1 TO CONTINUE";C65$
7640 IF C65$<"1"  OR C65$>"1" THEN GOTO 7660 ELSE
7650 IF C65$="1" THEN GOTO 7690
```

```
7660 PRINT "W R O N G   O P T I O N"
7670 PRINT "Please try again"
7680 GOTO 7630
7690 CLS:PRINT "LEARN BY HEART THIS FORMULA FOR 2 MINUTES"
7700 PRINT
7710 PRINT "_____":PRINT
7720 PRINT "                2              "
7730 PRINT "  (x+a)(x+b) = x + (a+b)x + ab    "
7740 PRINT "_____"
7750 PRINT
7760 PRINT "While expanding Product of two brackets each containing binomial
7770 PRINT "If one term is common the expansion is equal to"
7780 PRINT "= {(square of common term) + (sum of uncommon terms)(common term
7790 PRINT "    + (product of uncommon terms) )"
7800 PRINT
7810 PRINT
7820 PRINT "Here if we replace  x,a,b  by any terms or variables "
7830 PRINT "You have more examples in the above screen"
7840 PRINT
7850 LOCATE 25,40:INPUT "PRESS 1 TO CONTINUE";C66$
7860 IF C66$<"1"  OR C66$>"1" THEN GOTO 7880 ELSE 7870
7870 IF C66$="1" THEN GOTO 7910
7880 PRINT "W R O N G   O P T I O N"
7890 PRINT "Please try again"
7900 GOTO 7850
7910 CLS:PRINT :PRINT
7920 PRINT "(x+2)(x+5) = x   + (2+5)x + 2.5"
7930 PRINT "              2"
7940 PRINT "           = x   + 7x + 10"
7950 PRINT
7960 PRINT "                                2            "
7970 PRINT "(abc + 5x)(abc - 3x) = (abc) +(abc)(-3x)+(5x)(abc)+(5x)(-3x)"
7980 PRINT "                          2 2 2            "
7990 PRINT "                       = a b c  + 2xabc - 15xy"
8000 PRINT
8010 PRINT
8020 PRINT "(2x+3)(2x+5) = (2x)(2x)+(2x)5+3(2x)+3.5"
8030 PRINT "                 2        "
8040 PRINT "              = 4x  +10x+6x+15"
8050 PRINT "                2 "
8060 PRINT "              = 4x  +16x+15"
8070 PRINT
8080 PRINT
8090 PRINT "(3x+8)(5x+2) = (3x)(5x)+(3x)2+8(5x)+8.2"
8100 PRINT "                   2"
8110 PRINT "              = 15x  +6x+40x+16"
8120 PRINT "                   2"
8130 PRINT "              = 15x  +46x+16"
8140 LOCATE 25,40:INPUT "PRESS 1 TO CONTINUE";C67$
8150 IF C67$<"1"  OR C67$>"1" THEN GOTO 8170 ELSE 8160
8160 IF C67$="1" THEN GOTO 8200
8170 PRINT "W R O N G   O P T I O N"
8180 PRINT "Please try again"
8190 GOTO 8140
8200 CLS:PRINT
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```
8210 PRINT
8220 PRINT "(ax+b)(cx+d) = (ax)(cx)+(ax)d+b(cx)+b.d"
8230 PRINT "                  2"
8240 PRINT "               = acx  + adx + bcx + bd"
8250 PRINT "                  2                 "
8260 PRINT "               = acx  + (ad+bc)x + bd"
8270 PRINT
8280 PRINT "                2                2"
8290 PRINT "(x+y)(x+y) = x  + xy + yx + y"
8300 PRINT "              2    2  "
8310 PRINT "           = x  + y + 2xy"
8320 PRINT
8330 PRINT
8340 PRINT "(2p+q)(2p+q) = (2p)(2p)+(2p)q+q(2p)+q.q"
8350 PRINT "                  2                 2"
8360 PRINT "               = 4p  + 2pq + 2pq + q"
8370 PRINT "                  2          2"
8380 PRINT "               = 4p  + 4pq + q  "
8390 PRINT
8400 PRINT
8410 LOCATE 25,15:INPUT "PRESS 1 TO CONTINUE";C61$
8420 IF C61$<"1"  OR C61$>"1" THEN GOTO 8440 ELSE 8430
8430 IF C61$="1" THEN GOTO 8470
8440 PRINT "W R O N G   O P T I O N"
8450 PRINT "Please try again"
8460 GOTO 8410
8470 CLS
8480 PRINT
8490 PRINT "II METHOD :-"
8500 PRINT "----------"
8510 PRINT
8520 PRINT
8530 PRINT "(x+a)(x+b) = x.x+a.x+b.x+a.b"
8540 PRINT "           = x.x+(a+b)x+ab"
8550 PRINT:PRINT
8560 PRINT "(y-2)(y+5) = y.y+y.5+(-2)y+(-2)5"
8570 PRINT "           = y.y+5y-2y-10"
8580 PRINT "           = y.y+3y-10"
8590 LOCATE 25,40:INPUT "PRESS 1 TO CONTINUE";C68$
8600 IF C68$<"1"  OR C68$>"1" THEN GOTO 8620 ELSE 8610
8610 IF C68$="1" THEN GOTO 8650
8620 PRINT "W R O N G   O P T I O N"
8630 PRINT "Please try again"
8640 GOTO 8590
8650 CLS:PRINT
8660 PRINT
8670 PRINT "Try to expand following examples in your notebook"
8680 PRINT
8690 PRINT "Q1.      (3x+4)(5x+7)"
8700 PRINT
8710 PRINT "If you have solved this problem ":PRINT
8720 INPUT "Press 1 to see the correct answer";C13$:PRINT
8730 IF C13$<"1" OR C13$>"1" THEN GOTO 8750 ELSE 8740
8740 IF C13$="1" THEN GOTO 8780
8750 PRINT "W R O N G  O P T I O N "
```

```
8760 PRINT "Please try again"
8770 GOTO 8710
8780 CLS
8790 PRINT
8800 PRINT
8810 PRINT "(3x+4)(5x+7)=(3x)(5x)+(3x)7+4(5x)+4.7"
8820 PRINT "             =15x.x+21x+20x+28"
8830 PRINT "             =15x.x+41x+28"
8840 LOCATE 25,40:INPUT "PRESS 1 TO CONTINUE";C70$
8850 IF C70$<"1"  OR C70$>"1" THEN GOTO 8870 ELSE 8860
8860 IF C70$="1" THEN GOTO 8900
8870 PRINT "W R O N G   O P T I O N"
8880 PRINT "Please try again"
8890 GOTO 8840
8900 CLS:PRINT
8910 PRINT
8920 PRINT "Q2.      (2p-3q)(5p+6q)"
8930 PRINT
8940 PRINT "If you have solved this problem "
8950 INPUT "Press 1 to see the correct answer";C14$
8960 IF C14$<"1" OR C14$>"1" THEN GOTO 8980 ELSE  8970
8970 IF C14$="1" THEN GOTO 9010
8980 PRINT "W R O N G  O P T I O N "
8990 PRINT "Please try again"
9000 GOTO 8940
9010 PRINT
9020 PRINT "(2p-3q)(5p+6q) = (2p)(5p)+(2p)(6q)+(-3q)(5p)+(-3q)(6q)"
9030 PRINT "                = 10p.p+12pq-15pq-18q.q"
9040 PRINT "                = 10p.p-3pq-18q.q"
9050 IF C71$="1" THEN GOTO 9060
9060 CLS:PRINT
9070 PRINT
9080 PRINT "Q3.Expand       (3p-5)(6p-7)"
9090 PRINT
9100 PRINT "Had you solved the above problem in your notebook"
9110 PRINT
9120 PRINT "If not please do it first.Till then I am waiting for you"
9130 PRINT
9140 INPUT "FINISH ! Good,now press 1 to see the correct answer";C15$
9150 IF C15$<"1" OR C15$>"1" THEN GOTO 9160 ELSE 9190
9160 PRINT "W R O N G  O P T I O N "
9170 PRINT "Please try again"
9180 GOTO 9120
9190 IF C15$="1" THEN GOTO 9200
9200 CLS:PRINT:PRINT :PRINT " (3p-5)(6p-7) = (3p)(6p)+(3p)(-7)+(-5)(6p)+(-5)(
"
9210 PRINT "                    2                    "
9220 PRINT "               = 18p  - 21p - 30p + 35"
9230 PRINT "                   2"
9240 PRINT "               = 18p  - 51p + 35"
9250 LOCATE 25,40:INPUT "PRESS 1 TO CONTINUE";C80$
9260 IF C80$<"1"  OR C80$>"1" THEN GOTO 9280 ELSE 9270
9270 IF C80$="1" THEN GOTO 9310
9280 PRINT "W R O N G   O P T I O N"
9290 PRINT "Please try again"
9300 GOTO 9250
```

```
9310 CLS
9320 PRINT "Now we will learn ":PRINT :PRINT
9330 PRINT "                    2 "
9340 PRINT "EXPANSION OF (a+b)    "
9350 PRINT "----------------------"
9360 PRINT
9370 PRINT "       2      2           2"
9380 PRINT " (a+b)  =   a   + 2ab + b   "
9390 LOCATE 25,40:INPUT "PRESS 1 TO CONTINUE";C98$
9400 IF C98$<"1"  OR C98$>"1" THEN GOTO 9420 ELSE 9410
9410 IF C98$="1" THEN GOTO 9450
9420 PRINT "W R O N G   O P T I O N"
9430 PRINT "Please try again"
9440 GOTO 9390
9450 CLS:PRINT :PRINT:PRINT :PRINT "Learn by heart the above formula for 2 minu
es"
9460 PRINT "_____________________________________________________________________"
9470 PRINT
9480 PRINT " SQUARE OF SUM OF TWO TERMS =  SQUARE OF Ist  TERM                "
9490 PRINT "                              +TWICE THE PRODUCT OF TWO TERMS "
9500 PRINT "                              +SQUARE OF IInd TERM                "
9510 PRINT "_____________________________________________________________________"
9520 LOCATE 25,40:INPUT "PRESS 1 TO CONTINUE";C99$
9530 IF C99$<"1"  OR C99$>"1" THEN GOTO 9550 ELSE 9540
9540 IF C98$="1" THEN GOTO 9580
9550 PRINT "W R O N G   O P T I O N"
9560 PRINT "Please try again"
9570 GOTO 9520
9580 CLS:PRINT
9590 PRINT
9600 PRINT
9610 PRINT "Now see the following examples carefully :-"
9620 PRINT
9630 PRINT
9640 PRINT "          2    2             2"
9650 PRINT "1.  (x+5)  = x  + 2.5.x + 5  "
9660 PRINT "               2            "
9670 PRINT "            = x  + 10x + 25"
9680 PRINT
9690 PRINT
9700 PRINT "            2        2                  2"
9710 PRINT "2.  (abc+2)  = (abc)  + 2(abc)(2) + 2  "
9720 PRINT "                 2 2 2                "
9730 PRINT "               = a b c  + 4abc + 4"
9740 LOCATE 25,40:INPUT "PRESS 1 TO CONTINUE";C90$
9750 IF C90$<"1"  OR C90$>"1" THEN GOTO 9770 ELSE 9760
9760 IF C90$="1" THEN GOTO 9800
9770 PRINT "W R O N G   O P T I O N"
9780 PRINT "Please try again"
9790 GOTO 9740
9800 CLS:PRINT
9810 PRINT
9820 PRINT "            2        2                  2"
9830 PRINT "3.  (xy+ab)  = (xy)  + 2xyab + (ab)  "
9840 PRINT "                 2 2             2 2"
9850 PRINT "               = x y + 2xyab + a b   "
```

```
9860 PRINT
9870 PRINT
9880 PRINT "
9890 PRINT "
9900 LOCATE 25,40
9910 IF C91$<"1"  OR C91$>"1" THEN GOTO 9930 ELSE
9920 IF C91$="1" THEN GOTO 9960
9930 PRINT "W R O N G   O P T I
9940 PRINT "Please try again"
9950 GOTO 9900
9960 CLS:PRINT
9970 PRINT "No
9980 PRINT "                    2  "
9990 PRINT "EXPANSION OF (a-b)  "
10000 PRINT "^^^^^^^^^^^^^^^^^^^^^^^^"
10010 PRINT
10020 PRINT "     2    2                          2"
10030 PRINT "(a-b)  = a  - [ b(a-b) + b(a-b) + b ]"
10040 PRINT "          2         2     2  2"
10050 PRINT "       = a  - [ ab-b +ab-b +b ]"
10060 PRINT "          2            2  "
10070 PRINT "       = a  - [ 2ab - b  ]"
10080 PRINT "          2          2"
10090 PRINT "       = a  -2ab + b "
10100 LOCATE 25,40:INPUT "PRESS 1 TO CONTINUE";C94$
10110 IF C94$<"1"  OR C94$>"1" THEN GOTO 10130 ELSE 10120
10120 IF C94$="1" THEN GOTO 10160
10130 PRINT "W R O N G   O P T I O N"
10140 PRINT "Please try again"
10150 GOTO 10100
10160 CLS:PRINT
10170 PRINT
10180 PRINT "Please learn by heart the above formula for 2 minutes"
10190 PRINT
10200 PRINT "_____________________________________":PRINT
10210 PRINT "         2      2          2       "
10220 PRINT "   (a-b)   =  a  - 2ab + b        "
10230 PRINT "_____________________________________"
10240 PRINT
10250 PRINT
10260 PRINT "that is "
10270 PRINT
10280 PRINT "Square of difference of two terms =  Square of 1st term"
10290 PRINT "                                    -Twice the product of two term
"
10300 PRINT "                                    +Square of 2nd term"
10310 LOCATE 25,40:INPUT "PRESS 1 TO CONTINUE";C95$
10320 IF C95$<"1"  OR C95$>"1" THEN GOTO 10340 ELSE 10330
10330 IF C95$="1" THEN GOTO 10370
10340 PRINT "W R O N G   O P T I O N"
10350 PRINT "Please try again"
10360 GOTO 10310
10370 CLS:PRINT
10380 PRINT "Please try to understand the following examples carefully :-"
10390 PRINT
10400 PRINT
```

```
10410 PRINT "          2       2              2"
10420 PRINT "1.  (x-3)    =  x   - 2.3.x + 3"
10430 PRINT "                  2             "
10440 PRINT "              =  x   - 6x + 9"
10450 PRINT
10460 PRINT
10470 PRINT "            2         2                 2"
10480 PRINT "2.  (2xy-4)   = (2xy)   - 2(2xy)4 + 4"
10490 PRINT "                 2 2                  "
10500 PRINT "              = 4x y  -16xy +16 "
10510 LOCATE 25,40:INPUT "PRESS 1 TO CONTINUE";C96$
10520 IF C96$<"1"  OR C96$>"1" THEN GOTO 10540 ELSE 10530
10530 IF C96$="1" THEN GOTO 10570
10540 PRINT "W R O N G   O P T I O N"
10550 PRINT "Please t-y again"
10560 GOTO 10510
10570 CLS:PRINT
10580 PRINT
10590 PRINT "            2       2                   2 2"
10600 PRINT "3.  (ab-cd)   = (ab)  - 2(ab)(cd) + c d"
10610 PRINT "                 2 2              2 2"
10620 PRINT "              = a b  - 2abcd + c d"
10630 PRINT
10640 PRINT
10650 PRINT "
10660 PRINT
10670 PRINT
10680 PRINT
10690 PRINT
10700 PRINT
10710 PRINT
10720 LOCATE 25,40:INPUT "PRESS 1 TO CONTINUE";C97$
10730 IF C97$<"1"  OR C97$>"1" THEN GOTO 10750 ELSE 10740
10750 PRINT "W R O N G   O P T I O N"
10760 PRINT "Please try again"
10770 GOTO 10720
10780 CLS:PRINT :PRINT
10790 PRINT "Now we will study "
10800 PRINT
10810 PRINT "EXPANSION OF (a+b)(a-b)"
10820 PRINT "~~~~~~~~~~~~~~~~~~~~~~~~~~~"
10830 PRINT
10840 PRINT
10850 PRINT "                          2"
10860 PRINT "(a+b)(a-b) = (a+b)a -ab -b"
10870 PRINT "               2                2"
10880 PRINT "            = a  + ab - ab - b"
10890 PRINT "              2    2             "
10900 PRINT "            = a  - b "
10910 LOCATE 25,40:INPUT "PRESS 1 TO CONTINUE";C100$
10920 IF C100$<"1"  OR C100$>"1" THEN GOTO 10940 ELSE 10930
10930 IF C100$="1" THEN GOTO 10970
10940 PRINT "W R O N G   O P T I O N"
10950 PRINT "Please try again"
```

```
10950 PRINT "Please try again"
10960 GOTO 10910
10970 CLS:PRINT
10980 PRINT "Learn the above formula by heart for 2 minutes"
10990 PRINT "~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
11000 PRINT
11010 PRINT
11020 PRINT "_____________________________________________________________":PRINT
11030 PRINT "                               2       2                      "
11040 PRINT "    (a + b) (a - b)  =  a    - b                             "
11050 PRINT "_____________________________________________________________"
11060 PRINT
11070 PRINT
11080
11060 PRINT
11070 PRINT
11080 PRINT "That is
11090 PRINT
11100 PRINT "(Sum of two terms)(Difference of same two terms)"
11110 PRINT "                                 =  Square of first  term"
11120 PRINT "                                   -Square of second term"
11130 LOCATE 25,40:INPUT "PRESS 1 TO CONTINUE";C101$
11140 IF C101$<"1"  OR C101$>"1" THEN GOTO 11160 ELSE 11150
11150 IF C101$="1" THEN GOTO 11190
11160 PRINT "W R O N G   O P T I O N"
11170 PRINT "Please try again"
11180 GOTO 11130
11190 CLS:PRINT
11200 PRINT
11210 PRINT "Now we will see a few examples related to above formula "
11220 PRINT
11230 PRINT "Please pay attention.........."
11240 PRINT
11250 PRINT
11260 PRINT "                        2     2"
11270 PRINT "1.   (x+3)(x-3) = x    - 3"
11280 PRINT "                        2     "
11290 PRINT "                 = x    - 9"
11300 PRINT
11310 PRINT
11320 PRINT "                                 2          2         "
11330 PRINT "2.   (x + 1/x)(x - 1/x)   =   x    - (1/x)   "
11340 PRINT "                                 2        2          "
11350 PRINT "                          =   x    - 1/x    "
11360 PRINT
11370 LOCATE 25,40:INPUT "PRESS 1 TO CONTINUE";C102$
11380 IF C102$<"1"  OR C102$>"1" THEN GOTO 11400 ELSE 11390
11390 IF C102$="1" THEN GOTO 11430
11400 PRINT "W R O N G   O P T I O N"
11410 PRINT "Please try again"
11420 GOTO 11370
11430 CLS:PRINT
11440 PRINT "                                     2      2         "
11450 PRINT "3.   (xyz + 5)(xyz - 5) = (xyz)    - 5   "
11460 PRINT "                            2 2 2              "
11470 PRINT "                         = x y z    - 25 "
11480 PRINT
11490 PRINT
```

```
11510 PRINT "4.  (p/q + r/s)(p/q - r/s) = (p/q)  - (r/s)  "
11520 PRINT "                              2  2     2  2      "
11530 PRINT "                           = p /q   -  r /s     "
11540 PRINT
11550 PRINT
11560 PRINT
11570 PRINT
11580 PRINT
11590 PRINT
11600 LOCATE 25,40:INPUT "PRESS 1 TO CONTINUE";C103$
11610 IF C103$<"1"  OR C103$>"1" THEN GOTO 11630 ELSE 11620
11620 IF C103$="1" THEN GOTO  11660
11630 PRINT "W R O N G   O P T I O N"
11640 PRINT "Please try again"
11650 GOTO 11600
11660 CLS:PRINT
11670 PRINT
11680 PRINT "Now see carefully"
11690 PRINT
11700 PRINT "The above four formulas can be summarized as :-"
11710 PRINT
11720 PRINT "_____________________________________________________________________":PF
11730 PRINT "                                2                                    "
11740 PRINT "    (x + a)(x + b)      =  x  + (a+b)x + ab                         "
11750 PRINT "                 2          2          2                            "
11760 PRINT "        (a + b)         =  a  + 2ab + b                             "
11770 PRINT "                 2          2          2                            "
11780 PRINT "        (a - b)         =  a  - 2ab + b                             "
11790 PRINT "                           2    2                                   "
11800 PRINT "    (a + b)(a - b)      =  a  - b                                   "
11810 PRINT "                                                                    "
11820 PRINT "____________________________________________________________________"
11830 PRINT
11840 PRINT
11850 PRINT "The above formulae are called as Expansion formulae"
11860 PRINT
11870 PRINT "If we consider the same formulae in reverse order"
11880 PRINT
11890 PRINT "then those formulae are called as"
11900 PRINT
11910 PRINT "FORMULAE OF FACTORIZATION"
11920 PRINT
11930 LOCATE 25,40:INPUT "PRESS 1  TO CONTINUE";C105$
11940 IF C105$<"1"  OR C105$>"1" THEN GOTO 11960 ELSE 11950
11950 IF C105$="1" THEN GOTO 11990
11960 PRINT "W R O N G   O P T I O N"
11970 PRINT "Please try again"
11980 GOTO 11930
11990 CLS:PRINT:PRINT "Now solve following five examples in your notebook"
12000 PRINT
12010 PRINT "1>    (x+5)(x+3)":PRINT
12020 PRINT "2>    (xy+2)(xy-7)"
12030 PRINT "              2"
12040 PRINT "3>    (ap+bq)"
12050 PRINT "             2"
```

```
12060 PRINT "4>    (3x-z)":PRINT
12070 PRINT "5>    (a+3b)(a-3b)"
12080 PRINT :PRINT "If you have solved the above examples in your notebook"
12090 LOCATE 25,40:INPUT "PRESS 1 TO CONTINUE";C179$
12100 IF C179$<"1"  OR C179$>"1" THEN GOTO 12120 ELSE 12110
12110 IF C179$="1" THEN GOTO 12150
12120 PRINT "W R O N G   O P T I O N"
12130 PRINT "Please try again"
12140 GOTO 12090
12150 CLS:PRINT
12160 PRINT "Now cheak your answers with me"
12170 PRINT "                      2                  "
12180 PRINT "1> (x+5)(x+3)    =   x  + 3x + 5x + 15 "
12190 PRINT "                       2          "
12200 PRINT "                     =  x  + 8x + 15":PRINT
12210 PRINT "                          2                "
12220 PRINT "2> (xy+2)(xy-7)  =   (xy)  - 7xy +2xy -14"
12230 PRINT "
12240 PRINT "                     =  x  y   - 5 xy -14 ":PRINT
12250 PRINT "           2           2  2     2  2         "
12260 PRINT "3> (ap+bq)       =   a  p  + b  q  + 2abpq":PRINT
12270 PRINT "          2              2        2       "
12280 PRINT "4> (3x-2)        =   (3x)  + (-2)  - 12x"
12290 PRINT "
12300 PRINT "                     =  9x  + 4 -12x":PRINT
12310 PRINT "5> (a+3b)(a-3b)  = (a)   - (3b)"
12320 PRINT "                      2      2"
12330 LOCATE 25,40:INPUT "press 1 to continue";C250$
12340 IF C250$<"1"  OR C250$>"1" THEN GOTO 12360 ELSE 12350
12350 IF C250$="1" THEN GOTO 12390
12360 PRINT "W R O N G   O P T I O N"
12370 PRINT "Please try again"
12380 GOTO 12330
12390 CLS:PRINT:PRINT
12400 PRINT "O.K. now you have 5 more problems to work out"
12410 PRINT
12420 PRINT "First try to solve above problems in your notebook"
12430 PRINT
12440 PRINT "6>  (2x+3y)(2x+3y)"
12450 PRINT
12460 PRINT "7>  (x-2y)(x-2y)"
12470 PRINT
12480 PRINT "8>  (xyz+3p)(xyz-3p)"
12490 PRINT
12500 PRINT "9>  (2a+3b)(3a-2b)"
12510 PRINT
12520 PRINT "10> (x-1/x)(x+1/x)"
12530 PRINT:PRINT "if you have these problems in your notebook"
12540 LOCATE 25,40:INPUT "press 1 to continue";C350$
12550 IF C350$<"1" OR C350$>"1" THEN GOTO 12570 ELSE 12560
12560 IF C350$="1" THEN GOTO 12600
12570 PRINT "W R O N G   O P T I O N "
12580 PRINT "Please try again"
12590 GOTO 12540
12600 CLS:PRINT :PRINT
```

```
12610 PRINT "Now match your answers with me"
12620 PRINT
12630 PRINT "                                  2              2"
12640 PRINT "6>  (2x+3y)(2x+3y)   =  4x  + 12xy +9y":PRINT
12650 PRINT "
12660 PRINT "7>  (x-2y)(x-2y)     =  x  - 4xy + 4y  ":PRINT
12670 PRINT "                               2  2  2      2"
12680 PRINT "8>  (xyz+3p)(xyz-3p) = x  y  z  - 9p":PRINT
12690 PRINT "                                 2              2"
12700 PRINT "9>  (2a+3b)(3a-2b)   = 6a  + 5ab -6b  ":PRINT
12710 PRINT "                                 2         2"
12720 PRINT "10> (x-1/x)(x+1/x)   = x   -  1/x":PRINT
12730 LOCATE 25,40:INPUT "press 1 to continue";C400$
12740 IF C400$<"1" OR C400$>"1" THEN GOTO 12760 ELSE 12750
12750 IF C400$="1" THEN GOTO 12790
12760 PRINT "W R O N G   O P T I O N "
12770 PRINT "Please try again"
12780 GOTO 12730
12790 CLS:PRINT
12800 PRINT "To write one term instead of number of terms means "
12810 PRINT
12820 PRINT "to factorize the terms"
12830 PRINT
12840 PRINT
12850 PRINT "METHODS OF FACTORIZATION"
12860 PRINT "~~~~~~~~~~~~~~~~~~~~~~~~~~"
12870 PRINT
12880 PRINT
12890 PRINT "(I)     Take common from all the terms"
12900 PRINT
12910 PRINT "e.g.    ax + ay + az"
12920 PRINT
12930 PRINT "        a [ x + y + z ]"
12940 PRINT
12950 LOCATE 25,40:INPUT "PRESS 1 TO CONTINUE";C106$
12960 IF C106$<"1" OR C106$>"1" THEN GOTO 12980 ELSE 12970
12970 IF C106$="1" THEN GOTO 13010
12980 PRINT "W R O N G   O P T I O N "
12990 PRINT "Please try again"
13000 GOTO 12950
13010 CLS:PRINT
13020 PRINT "Study the following examples carefully"
13030 PRINT
13040 PRINT "Factorize the following :-"
13050 PRINT
13060 PRINT "1.   2y - 10 "
13070 PRINT "    =2(y - 5)"
13080 PRINT
13090 PRINT "        2       "
13100 PRINT "2.   4a  + 2ab"
13110 PRINT "    =2a(2a + b)"
13120 PRINT
13130 PRINT           22"
13140 PRINT "3.   16x y - 8xy"
13150 PRINT "
```

```
13160 PRINT "     =8xy(2x - y)"
13170 LOCATE 25,40:INPUT "PRESS 1 TO CONTINUE";C110$
13180 IF C110$<"1" OR C110$>"1" THEN GOTO 13200 ELSE 13190
13190 IF C110$="1" THEN GOTO 13230
13200 PRINT "W R O N G   O P T I O N "
13210 PRINT "Please try again"
13220 GOTO 13170
13230 CLS:PRINT
13240 PRINT "                  2"
13250 PRINT "4.    x(a+b) - x"
13260 PRINT "                      "
13270 PRINT "     =x(a + b - x)"
13280 PRINT
13290 PRINT
13300 PRINT "5.    m(x+y) - (x + y)"
13310 PRINT
13320 PRINT "     =(x+y)[m - 1]"
13330 LOCATE 25,40:INPUT "PRESS 1 TO CONTINUE";C107$
13340 IF C107$<"1" OR C107$>"1" THEN GOTO 13360 ELSE 13350
13350 IF C107$="1" THEN GOTO 13390
13360 PRINT "W R O N G   O P T I O N "
13370 PRINT "Please try again"
13380 GOTO 13330
13390 CLS:PRINT
13400 PRINT
13410 PRINT "(II)  Take common by making groups :-"
13420 PRINT
13430 PRINT
13440 PRINT "       xa + xb + yb + ya "
13450 PRINT
13460 PRINT "       x(a + b) + y(b + a)"
13470 PRINT
13480 PRINT "       (a + b) (x + y)"
13490 PRINT
13500 LOCATE 25,40:INPUT "PRESS 1 TO CONTINUE";C120$
13510 IF C120$<"1" OR C120$>"1" THEN GOTO 13530 ELSE 13520
13520 IF C120$="1" THEN GOTO 13560
13530 PRINT "W R O N G   O P T I O N "
13540 PRINT "Please try again"
13550 GOTO 13500
13560 PRINT
13570 PRINT "Examples :-"
13580 PRINT "~~~~~~~~~"
13590 PRINT
13600 PRINT "1)     am + bm + ax + bx"
13610 PRINT "     = a(m + x) + b(m + x)"
13620 PRINT "     = (a + b) (m + x)"
13630 PRINT
13640 PRINT "2)     2x - 2y - ax + ay "
13650 PRINT "     = x(2 - a) + y(a - 2)"
13660 PRINT "     = x(2 - a) - y(2 - a)"
13670 PRINT "     = (x - y)(2 - a)" :PRINT
13680 PRINT "                      2                "
13690 PRINT "3)     1 + x + xy +x y"
13700 PRINT "     = 1 + x + xy(1 + x) "
```

```
13710 PRINT "                                                    "
13720 PRINT "     = 1(1 + x) + xy(1 + x)                          "
13730 PRINT "     = (1 + xy) (1 + x)"
13740 PRINT
13750 PRINT
13760 PRINT
13770 LOCATE 25,40:INPUT "PRESS 1 TO CONTINUE";C92$
13780 IF C92$<"1" OR C92$>"1" THEN GOTO 13800 ELSE 13790
13790 IF C92$="1" THEN GOTO 13830
13800 PRINT "W R O N G   O P T I O N "
13810 PRINT "Please try again"
13820 GOTO 13770
13830 CLS:PRINT
13840 PRINT
13850 PRINT "(III) USE OF FACTORIZATION FORMULA"
13860 PRINT "      ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~"
13870 PRINT
13880 PRINT "  2    2"
13890 PRINT "       a  - b     =  (a + b)(a - b)    "
13900 PRINT
13910 PRINT "   2           2              2 "
13920 PRINT " a  + 2ab + b     =  (a + b)    "
13930 PRINT "                  =  (a + b)(a + b)"
13940 PRINT "
13950 PRINT "  2           2              2"
13960 PRINT " a  - 2ab + b     =  (a - b)"
13970 PRINT "                  =  (a - b)(a - b)"
13980 PRINT
13990 PRINT "
14000 PRINT " x  + (a + b)x + ab  =  (x + a)(x + b)"
14010 PRINT
14020 PRINT
14030 LOCATE 25,40:INPUT "PRESS 1 TO CONTINUE";C93$
14040 IF C93$<"1" OR C93$>"1" THEN GOTO 14060 ELSE 14050
14050 IF C93$="1" THEN GOTO 14090
14060 PRINT "W R O N G   O P T I O N "
14070 PRINT "Please try again"
14080 GOTO 14030
14090 CLS:PRINT
14100 PRINT "Now we will see a few examples related to above formulas"
14110 PRINT
14120 PRINT
14130 PRINT "Q : Factorise the above expressions....."
14140 PRINT
14150 PRINT
14160 PRINT "         2                                          "
14170 PRINT "(1)    9x  - 1
14180 PRINT "      =(3x + 1)(3x - 1)"
14190 PRINT
14200 PRINT "        2"
14210 PRINT "(2)    t  - 9"
14220 PRINT "      =(t + 3)(t - 3)"
14230 PRINT
14240 PRINT "
14250 PRINT "(3)    4y  - 49"
```

```
14260 PRINT "       =(2y + 7)(2y - 7)"
14270 PRINT "
14280 PRINT "            2       2"
14290 PRINT "(4)     81p  - 25q"
14300 PRINT "       =(9p + 5q)(9p - 5q)"
14310 PRINT
14320 PRINT
14330 PRINT "(5)     y  - 121"
14340 PRINT "       =(y + 11)(y - 11)"
14350 PRINT
14360 LOCATE 25,60:INPUT "PRESS 1 TO CONTINUE";C500$
14370 IF C500$<"1" OR C500$>"1" THEN GOTO 14390 ELSE 14380
14380 IF C500$="1" THEN GOTO 14420
14390 PRINT "W R O N G   O P T I O N "
14400 PRINT "Please try again"
14410 GOTO 14360
14420 CLS:PRINT:PRINT "Now please solve the above question in your notebook"
14430 PRINT:PRINT
14440 PRINT "QUESTION : Write down the binomials of which the following "
14450 PRINT "             expressions are perfect squares ?"
14460 PRINT
14470 PRINT "                  2              "
14480 PRINT "     (1)     36p  + 60p + 25"
14490 PRINT
14500 PRINT "                 2              "
14510 PRINT "     (2)     p  + 6p + 25"
14520 PRINT
14530 PRINT "                 2             "
14540 PRINT "     (3)     y  - 6p + 9"
14550 PRINT
14560 PRINT "                   2                2"
14570 PRINT "     (4)     9x  - 12xy + 4y"
14580 PRINT
14590 PRINT "                   2             2"
14600 PRINT "     (5)     4x  + 4 + 1/x"
14610 PRINT
14620 PRINT "If you are ready with the answers then"
14630 LOCATE 25,50:INPUT "PRESS 1 TO CONTINUE";C510$
14640 IF C510$<"1" OR C510$>"1" THEN GOTO 14660 ELSE 14650
14650 IF C510$="1" THEN GOTO 14690
14660 PRINT "W R O N G   O P T I O N "
14670 PRINT "Please try again"
14680 GOTO 14630
14690 CLS:PRINT
14700 PRINT
14710 PRINT "Check your answers with me"
14720 PRINT "          2                                  2"
14730 PRINT "(1)  36p  + 60p + 25   =   ( 6p + 5 )"
14740 PRINT
14750 PRINT "
14760 PRINT "(2)  p  - 6p + 9       =   ( p + 3 )   "
14770 PRINT
14780 PRINT "       2                                 2"
14790 PRINT "(3)  y  - 6y + 9       =   ( y - 3 )"
14800 PRINT
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14810 PRINT "        2              2                  2"
14820 PRINT "(4)  9x  - 12xy + 4y  =    3x - 2y )"
14830 PRINT
14840 PRINT "        2            2                    2"
14850 PRINT "(5)  4x  + 4 + 1/x    =  ( 2x + 1/x )"
14860 PRINT
14870 PRINT "Very Good ! Go Ahead....."
14880 LOCATE 25,50:INPUT "PRESS 1 TO CONTINUE";C520$
14890 IF C520$<"1" OR C520$>"1" THEN GOTO 14910 ELSE 14900
14900 IF C520$="1" THEN GOTO 14940
14910 PRINT "W R O N G   O P T I O N "
14920 PRINT "Please try again"
14930 GOTO 14880
14940 CLS:PRINT :PRINT
14950 PRINT "QUESTION : Write down the factors of the following through"
14960 PRINT "           observation only in your notebook :"
14970 PRINT
14980 PRINT "             2          "
14990 PRINT "      (1)   x  + 7x + 12":PRINT
15000 PRINT "             2           "
15010 PRINT "      (2)   x  + 13x + 12":PRINT
15020 PRINT "
15030 PRINT "After writing in your notebook"
15040 LOCATE 25,50:INPUT "PRESS 1 TO CONTINUE";C600$
15050 IF C600$="1" THEN GOTO 15060
15060 CLS
15070 PRINT
15080 PRINT
15090 PRINT "Now check your answers with me"
15100 PRINT
15110 PRINT "      2            "
15120 PRINT "(1)  x  + 7x + 12  = (x+3)(x+4)"
15130 PRINT
15140 PRINT "      2                          "
15150 PRINT "(2)  x  + 13x + 12 = (x+1)(x+12)"
15160 PRINT
15170 PRINT
15180 PRINT "Exillent ! Go Ahead....."
15190 LOCATE 25,50:INPUT "PRESS 1 TO CONTINUE";C610$
15200 IF C610$<"1" OR C610$>"1" THEN GOTO 15220 ELSE 15210
15210 IF C610$="1" THEN GOTO 15250
15220 PRINT "W R O N G   O P T I O N "
15230 PRINT "Please try again"
15240 GOTO 15190
15250 CLS
15260 PRINT
15270 PRINT
15280 PRINT "QUESTION : Find the factors of the following by splitting"
15290 PRINT "           the middle term ?"
15300 PRINT
15310 PRINT "First solve the above problems in your notebook"
15320 PRINT
15330 PRINT "      2            "
15340 PRINT "(1)  p  + 17p + 42"
15350 PRINT
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15360 PRINT "      2              "
15370 PRINT "(2)  y  + 21y + 54 "
15380 PRINT
15390 PRINT "      2             "
15400 PRINT "(3)  n  + 18n + 80"
15410 PRINT
15420 PRINT "If you have solved then"
15430 LOCATE 25,50:INPUT "PRESS 1 TO CONTINUE";C700$
15440 IF C700$<"1" OR C700$>"1" THEN GOTO 15460 ELSE 15450
15450 IF C700$="1" THEN GOTO 15490
15460 PRINT "W R O N G   O P T I O N "
15470 PRINT "Please try again"
15480 GOTO 15430
15490 CLS:PRINT :PRINT
15500 PRINT "Check your answers with me"
15510 PRINT
15520 PRINT "      2                              "
15530 PRINT "(1)  p  + 17p + 42  =  (p+3)(p+14)"
15540 PRINT
15550 PRINT "      2                              "
15560 PRINT "(2)  y  + 21y + 54  =  (y+3)(y+18)"
15570 PRINT "
15580 PRINT "      2                              "
15590 PRINT "(3)  n  + 18n + 80  =  (n+8)(n+10)"
15600 PRINT
15610 LOCATE 25,50
15620 INPUT "PRESS 1 TO CONTINUE";C720$
15630 IF C720$<"1" OR C720$>"1" THEN GOTO 15650 ELSE 15640
15640 IF C720$="1" THEN GOTO  15680
15650 PRINT "W R O N G   O P T I O N "
15660 PRINT "Please try again"
15670 GOTO 15620
15680 CLS:PRINT :PRINT
15690 PRINT "QUESTION : Find the factors of "
15700 PRINT :PRINT "Calculate first in your notebook"
15710 PRINT "      2             "
15720 PRINT "(1)  x  - 7x + 12"
15730 PRINT
15740 PRINT "      2              "
15750 PRINT "(2)  y  - 15y + 36"
15760 PRINT
15770 PRINT "      2              "
15780 PRINT "(3)  x  - 19x + 90"
15790 PRINT
15800 PRINT "      2            "
15810 PRINT "(4)  n  - 22n + 72"
15820 PRINT
15830 PRINT "Be ready with your answers before pressing anything"
15840 LOCATE 25,50:INPUT "Now Press 1 to Continue";C750$
15850 IF C750$<"1" OR C750$>"1" THEN GOTO 15870 ELSE 15860
15860 IF C750$="1" THEN GOTO  15900
15870 PRINT "W R O N G   O P T I O N "
15880 PRINT "Please try again"
15890 GOTO 15840
15900 CLS
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15910 PRINT
15920 PRINT
15930 PRINT "Check your answers with me"
15940 PRINT
15950 PRINT "       2            "
15960 PRINT "(1)   x  - 7x + 12  =  (x-3)(x-4)"
15970 PRINT
15980 PRINT "       2                          "
15990 PRINT "(2)   y - 15y + 36  =  (y-3)(y-12)"
16000 PRINT
16010 PRINT "       2                          "
16020 PRINT "(3)   x  - 19x + 90 =  (x-9)(x-10)"
16030 PRINT
16040 PRINT "       2                          "
16050 PRINT "(4)   n  - 22n + 72 =  (n-4)(n-18)"
16060 PRINT :PRINT "Weldone !"
16070 LOCATE 25,50
16080 INPUT "PRESS 1 TO CONTINUE";C740$
16090 IF C740$<"1" OR C740$>"1" THEN GOTO 16110 ELSE 16100
16100 IF C740$="1" THEN GOTO  16140
16110 PRINT "W R O N G   O P T I O N "
16120 PRINT "Please try again"
16130 GOTO 16080
16140 CLS
16150 PRINT
16160 PRINT
16170 PRINT "QUESTION : Factorise the following in your notebook"
16180 PRINT
16190 PRINT "       2           "
16200 PRINT "(1)   x  - 3x -18'
16210 PRINT
16220 PRINT "       2             "
16230 PRINT "(2)   m  + 16m - 36"
16240 PRINT
16250 PRINT "       2           "
16260 PRINT "(3)   p  + p - 42"
16270 PRINT
16280 PRINT "       2             "
16290 PRINT "(4)   n  + 7n - 30"
16300 PRINT
16310 PRINT "Are you ready with answers , then"
16320 LOCATE 25,50
16330 INPUT "PRESS1 TO CONTINUE";C880$
16340 IF C880$<"1" OR C880$>"1" THEN GOTO 16360 ELSE 16350
16350 IF C880$="1" THEN GOTO 16390
16360 PRINT "W R O N G   O P T I O N '
16370 PRINT "Please try again"
16380 GOTO 16330
16390 CLS
16400 PRINT
16410 PRINT
16420 PRINT "Now check your answers with me"
1643
16430 PRINT
16440 PRINT "       2                          "
16450 PRINT "(1)   x  - 3x - 18  =  (x+3)(x-6)"
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16460 PRINT
16470 PRINT "       2                                "
16480 PRINT "(2)   m   + 16m - 36 =   (m-2)(m+18)"
16490 PRINT
16500 PRINT "       2                                "
16510 PRINT "(3)   p   + p - 42    =   (p+7)(p-6)"
16520 PRINT
16530 PRINT "       2              "
16540 PRINT "(4)   n   + 7n - 30   =   (n-3)(n+10)":PRINT
16550 PRINT "VERY GOOD !":PRINT:PRINT "YOU HAVE COMPLETED ALL EXERCISES"
16560 LOCATE 24,50:INPUT "PRESS 1 TO STUDY AGAIN";C888$
16570 LOCATE 25,50:INPUT "PRESS Z TO QUIT";C889$
16580 IF C888$="1" THEN GOTO 10 ELSE 16590
16590 IF C889$="Z" THEN GOTO 16600
16600 CLS
16610 SCREEN 1
16620 PRINT
16630 LOCATE 15,40:PRINT "BYE BYE"
16640 LOCATE 17,40:PRINT "SEE YOU !"
16650 PRINT
16660 GOTO 16670
16670 CLS:CLS:CLS:END
```