

```

1 1 CLS
2 2 Print "
"
3 3 PRINT
4 5 Print " BINOMIAL REDUNDANT RELIABILITY (BINOMIAL.BAS) "
5 6 Print " ORIGINAL DATE: CIRCA 1986"
6 7 Print " REVISION DATE: October 22, 2020"
7 8 Print " AUTHOR: Phil Rutherford"
8 9 Print " RUN DATE: ";Date$;
9 10 Print " (DD-MM-YYY) "
10 11 Print " RUN TIME: ";TIME$
11 12 Print " RUN WITH MMBASIC (www.mmbasic.com) "
12 13 Print
13 14 Print " RELIABILITY OF PARALLEL OPERATING AND STANDBY UNITS USING THE BINOMIAL
EXPANSION"
14 15 Print
15 18 Input " MINIMUM NUMBER OF OPERATING UNITS REQUIRED";M
16 20 Input " MAXIMUM NUMBER OF ADDITIONAL OPERATING REDUNDANT UNITS";N
17 30 Input " UNIT FAILURE RATE PER HOUR";LAMDA
18 40 Input " MISSION TIME IN HOURS";T
19 47 Print
20 50 RNOFAIL=Exp(-1*M*LAMDA*T)
21 60 Q=1-Exp(-1*LAMDA*T)
22 70 Print " RELIABILITY WITH 0 OPERATING REDUNDANT UNITS IS";RNOFAIL;
23 71 Print TAB(65);" P(=>"M;"/";M;".S) "
24 80 SUM=1
25 90 For Y=1 To N
26 100 NUM=Y
27 105 GOSUB 200
28 110 YFAC=I
29 120 PROD=1
30 130 FOR L=1 TO Y
31 131 PROD=PROD*(Y-L+M)
32 132 NEXT L
33 140 COEF = PROD/YFAC
34 150 SUM=SUM+COEF*Q^Y
35 160 R=RNOFAIL*SUM
36 170 Print " RELIABILITY WITH";Y;" OPERATING REDUNDANT UNITS IS";R;
37 171 Print TAB(65);" P(=>"M;"/";M+Y;".S) "
38 180 Next Y
39 185 Print "
"
40 190 End
41 199 '-----
42 200 'SUBROUTINE FOR FACTORIALS
43 201 '-----
44 210 I=1
45 220 FOR J=1 TO NUM
46 230 I=I*J
47 235 NEXT J
48 240 RETURN

```