

I. INTRODUCTION

MATH(JOSS) is a problem solver for people who are not programmers and who do not wish to become programmers.

- MATH can be used for desk calculator work.
- MATH can be used to perform standard tasks for which programs are available in a growing library.
- MATH can be used to solve problems through use of the powerful JOSS* command language.

You can become acquainted with MATH right at a terminal. See page 3 for information on how to take the MATH lessons.

DESK CALCULATOR

Here are some examples of MATH being used as a desk calculator. What you key is in green. MATH's responses are in black.

```
Type 2+2.
2+2 = 4

Set x=3.
Type x.
x = 3

Type x+2,x-2,2*x,x/2,x*2.
x+2 = 5
x-2 = 1
2*x = 6
x/2 = 1.5
x*2 = 9

Type [(|x-5|*3+4)*2-15]*3+10.
[(|x-5|*3+4)*2-15]*3+10 = 25

Type sqrt(144),log(10),exp(1).
sqrt(144) = 12
log(10) = 2.30258509
exp(1) = 2.71828183

Type sin(.4),cos(.4),sin(.4)*2+cos(.4)*2.
sin(.4) = .389418342
cos(.4) = .921060994
sin(.4)*2+cos(.4)*2 = 1
```

* Registered trade-mark of the RAND Corporation.

LIBRARY PROGRAMS

Programs which perform many standard tasks can be found in the MATH library.

To see a list of those currently available, you key *Type library summary*.

Illustrated below is the loan amortization program. You enter the amount of the loan (\$3200), the interest rate (7.9%), and the repayment period (12 months). MATH(JOSS) indicates that the monthly payments are \$278.22 and then types out a table showing how much of each installment goes to pay interest and how much to reduce the debt.

Get loan from library.

Done.

Do part 1.

MATH Loan Amortization Calculation

Please enter the following information:

The amount of the loan = 3200

The annual interest rate in percent (e.g., 6.5) = 7.9

The term of the loan in months = 12

The number of the month of the first payment (1 = Jan., etc.) = 4

The year of the first payment (1966, etc.) = 1968

Amount: 3200.00; Rate: 7.90; Term: 12 months; Payments: 278.22

Mo.	Int.	Pr.	Bal.
Apr.	21.07	257.15	2942.85
May	19.38	258.84	2684.01
June	17.67	260.55	2423.46
July	15.96	262.26	2161.20
Aug.	14.23	263.99	1897.21
Sep.	12.49	265.73	1631.48
Oct.	10.75	267.47	1364.01
Nov.	8.98	269.24	1094.77
Dec.	7.21	271.01	823.76

Interest paid in 1968: 127.74

Jan.	5.43	272.79	550.97
Feb.	3.63	274.59	276.38
Mar.	1.82	276.38	.00

(Final Payment: 278.20)

Interest paid in 1969: 10.88

PROBLEM SOLVING

Perhaps you are interested in right triangles. You know that the square of the hypotenuse equals the sum of the squares of the other two sides ($c^2=a^2+b^2$).

You key in a few steps:

1.1 Do part 2 for $b=1(1)a$.

2.1 Set $c=\text{sqrt}(a^2+b^2)$.

2.2 Type a, b, c in form 1.

Form 1:

a = b = c = .

Do part 1 for $a=1(1)3$.

a = 1 b = 1 c = 1.414

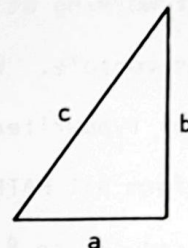
a = 2 b = 1 c = 2.236

a = 2 b = 2 c = 2.828

a = 3 b = 1 c = 3.162

a = 3 b = 2 c = 3.606

a = 3 b = 3 c = 4.243



What you want is a list of those right triangles which have integral sides.

You modify your solution:

2.15 Line if $\text{fp}(c)=0$.

2.2 Type a, b, c in form 1 if $\text{fp}(c)=0$.

Type part 2.

2.1 Set $c=\text{sqrt}(a^2+b^2)$.

2.15 Line if $\text{fp}(c)=0$.

2.2 Type a, b, c in form 1 if $\text{fp}(c)=0$.

Do part 1 for $a=1(1)12$.

a = 4 b = 3 c = 5.000

a = 8 b = 6 c = 10.000

a = 12 b = 5 c = 13.000

a = 12 b = 9 c = 15.000

MATH LESSONS

If you wish to become more familiar with MATH, you need only take the lessons that are available through any MATH(JOSS) terminal. After signing on you key:

Get math-lesson(1) from library.

Do part 1.

If you have never signed onto this or a similar system before, have someone help you. For your convenience you will find sign-on details in the next section.