


```
b := 8
```

```
> a + b;
```

```
13
```

Redefine and store a and b as the characters a and b.

```
> a := 'a' ; b := 'b';
```

```
a := a
```

```
b := b
```

Print the first 100 elements of the Fibonacci sequence 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, ...

(In Maple's memory set $a[1]=1$, $a[2]=1$ and $a[i] = a[i-1] + a[i-2]$ for i from 3 to 100.

Note the use of `:=` in the command.

Do not print the intermediate results, hence use `:` and not `;`

"od" means "end do".

Finally convert a into a list (from an "array").

The result of this is printed because of the final `;"`)

```
> a[1] := 1: a[2] := 1 :  
  for i from 3 to 100 do  
    a[i] := a[i-1] + a[i-2]: od:  
  convert(a, 'list');
```

```
[1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, 987, 1597, 2584, 4181, 6765, 10946, 17711, 28657,  
46368, 75025, 121393, 196418, 317811, 514229, 832040, 1346269, 2178309, 3524578, 5702887,  
9227465, 14930352, 24157817, 39088169, 63245986, 102334155, 165580141, 267914296, 433494437,  
701408733, 1134903170, 1836311903, 2971215073, 4807526976, 7778742049, 12586269025,  
20365011074, 32951280099, 53316291173, 86267571272, 139583862445, 225851433717,  
365435296162, 591286729879, 956722026041, 1548008755920, 2504730781961, 4052739537881,  
6557470319842, 10610209857723, 17167680177565, 27777890035288, 44945570212853,  
72723460248141, 117669030460994, 190392490709135, 308061521170129, 498454011879264,  
806515533049393, 1304969544928657, 2111485077978050, 3416454622906707, 5527939700884757,  
8944394323791464, 14472334024676221, 23416728348467685, 37889062373143906,  
61305790721611591, 99194853094755497, 160500643816367088, 259695496911122585,  
420196140727489673, 679891637638612258, 1100087778366101931, 1779979416004714189,  
2880067194370816120, 4660046610375530309, 7540113804746346429, 12200160415121876738,  
19740274219868223167, 31940434634990099905, 51680708854858323072, 83621143489848422977,  
135301852344706746049, 218922995834555169026, 354224848179261915075]
```

What is the 100000th prime?

```
> ithprime(100000);
```

```
15485863
```

Is a given number a prime?

```
> isprime(4896276498678467893766480764);
```

```
false
```

Factorise a number.

(i.e. "integer factor")

```
> ifactor(987098398654098299877430953245);  
      (5) (23) (67) (34490323663013) (1101220261) (3373)
```

What is the next prime after a given number?

```
> p = nextprime(48962764986784678937);  
      p = 48962764986784678961
```

What is the formula for the sum of the first k integers? Sum of their squares?

(That is $\sum j^2$ from $j=1$ up to k .

Simplify the resulting expression.)

```
> simplify(sum(j, j=1..k)) ; simplify(sum(j^2, j=1..k));
```

$$\frac{1}{2}k^2 + \frac{1}{2}k$$

$$\frac{1}{3}k^3 + \frac{1}{2}k^2 + \frac{1}{6}k$$

Is there a formula for the sum of the 10th powers of the first k integers?

```
> simplify(sum(j^10, j=1..k)) ;
```

$$\frac{5}{66}k + \frac{1}{2}k^{10} + \frac{1}{11}k^{11} + k^5 - k^7 + \frac{5}{6}k^9 - \frac{1}{2}k^3$$

Integrate $x^3 (\ln(x))^2$ with respect to x .

```
> int(x^3 * (ln(x))^2 , x );
```

$$\frac{1}{4}x^4 \ln(x)^2 - \frac{1}{8}x^4 \ln(x) + \frac{1}{32}x^4$$

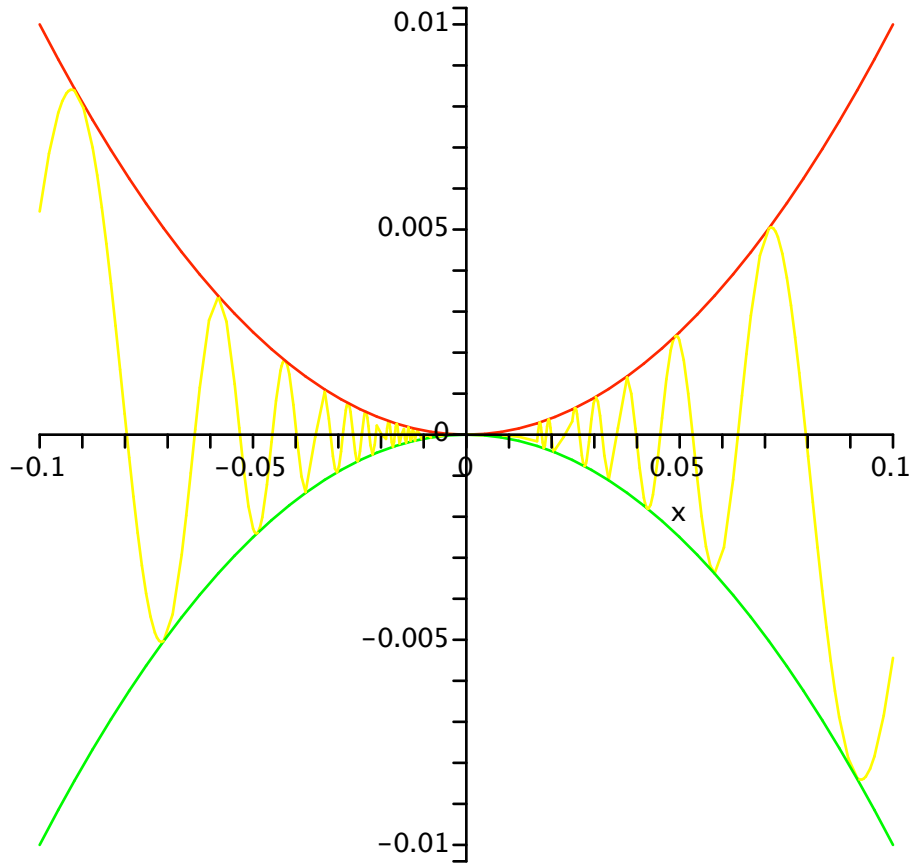
Find a formula for the integral of $e^{(ax)} + \cos(bx)$ with respect to x .

```
> int(exp(a*x) * cos(b*x) , x);
```

$$\frac{a e^{(ax)} \cos(bx)}{a^2 + b^2} + \frac{b e^{(ax)} \sin(bx)}{a^2 + b^2}$$

Plot $x^2 \sin(1/x)$ from -0.1 to 0.1 and compare with x^2 and $-x^2$

```
> plot([x^2, -x^2, x^2 * sin(1/x)] , x = -0.1..0.1 );
```



Plot $\sin(xy)$ for x and y each between $-\pi$ and π and put the axes in a box.

```
> plot3d( sin(x*y) , x=0..Pi, y=0..Pi , axes = boxed );
```

