```
/* ADDITION */;
2+5;
```

$$7$$

```
/* SUB */;
5-2;
```

$$3$$

```
/*MUL */;
2·3;
```

$$6$$

```
/*DIV */;
10/2;
```

$$5$$

```
/* Power*/
2^3;
```

$$8$$

```
/* Simplifying expression*/
expand((x + 2)·(x - 2));
```

$$x^2 - 4$$

```
/*Assigning variable*/
a: 10;
b: 5;
a + b;
```

$$10 \qquad 5 \qquad 15$$

```
/*Solving Equation*/
solve(x^2 - 4 = 0, x);
```

$$[x = -2, x = 2]$$

```
/*Defining Function*/
f(x) := x^2 + 2·x + 1;
f(2);
```

$$f(x) := x^2 + 2x + 1 \qquad 9$$

```
/*Plotting*/
plot2d(x^2, [x, -5, 5]);
```

$$\text{false}$$

```
/*Expanding the expression*/
expand((x + 2)^3);
```

$$x^3 + 6\,x^2 + 12\,x + 8$$

```
/*Calculating GCD*/
gcd(12, 18);
```

$$6$$

```
/*Calculating LCM*/
lcm(12, 18);
```

$$36$$

```
/*Modulus Operation*/
mod(10, 3);
```

$$1$$

```
/*Floor and Ceiling Functions*/
floor(5.7);
ceiling(5.2);
```

$$5 \qquad 6$$

```
/* Absolute Value*/
abs(-7);
```

$$7$$

```
/*Finding Roots of Polynomials*/
allroots(x^2 - 4);
```

$$[x = 2.0, x = -2.0]$$

```
random(10); /* Generates a random number between 0 and 9 */
```

$$2$$

```
/* Define a function that squares a number */
square(x) := x^2;

/* Call the function */
square(5);  /* Output: 25 */
```

$$\mathrm{square}(x) := x^2 \qquad 25$$

```
/* Factor an expression */
factor(x^2 - 1);  /* Output: (x - 1)*(x + 1) */
```

$$(x-1)\,(x+1)$$

```
/* Differentiate an expression with respect to x */
diff(sin(x), x);  /* Output: cos(x) */

/* Integrate an expression with respect to x */
integrate(x^2, x);  /* Output: x^3/3 */
```

$$\cos(x) \qquad \frac{x^3}{3}$$

```
/* Define a list */
mylist : [1, 2, 3, 4, 5];

/* Access elements of a list */
first(mylist);  /* Output: 1 */
rest(mylist);  /* Output: [2, 3, 4, 5] */

/* Append an element to a list */
endcons(6, mylist);  /* Output: [1, 2, 3, 4, 5, 6] */
```

$$[1,2,3,4,5] \qquad 1 \qquad [2,3,4,5] \qquad [1,2,3,4,5,6]$$

```
/* This is a single-line comment */

/*
This is a
multi-line comment
*/;

/* Clear a specific variable */
kill(x);

/* Reset all variables and functions */
kill(all);
```

done done

```
/* Define complex numbers */
z1 : 2 + 3·%i;  /* %i represents the imaginary unit */

/* Complex conjugate */
conjugate(z1);  /* Output: 2 - 3*%i */

/* Real and imaginary parts */
realpart(z1);  /* Output: 2 */
imagpart(z1);  /* Output: 3 */
```

3 %i + 2 2 − 3 %i 2 3

```
/* Ask for user input */
input("Enter a value for x: ", x);  /* User enters a value */

/* Display output */
print("The value of x is:", x);
```

input(Enter a value for x: ,x)

The value of x is: x x

```
/* Compute a large factorial */
factorial(50);  /* Output: A large number */
```

30414093201713378043612608166064768844377641568960512000000000000

```
/* Define sets */
A : {1, 2, 3};
B : {2, 3, 4};

/* Union of sets */
union(A, B);  /* Output: {1, 2, 3, 4} */

/* Intersection of sets */
intersection(A, B);  /* Output: {2, 3} */

/* Set difference */
setdifference(A, B);  /* Output: {1} */
```

{1,2,3} {2,3,4} {1,2,3,4} {2,3}

{1}

```
/* Use float() to convert a fraction to a decimal */
float(1/3);  /* Output: 0.3333333333333333 */
```

0.3333333333333333