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|  | **Function** | **Definition** | **Description** |
| **Trigonometric functions** | [acos()](https://moodleformulas.org/course/view.php?id=31&section=12) | Arc cosine | Returns the inverse cosine or arccosine of the argument as a number (radian angle). |
|  | [asin()](https://moodleformulas.org/course/view.php?id=31&section=14) | Arc sine | Returns the inverse sine or arcsine of the argument as a number (radian angle). |
|  | [atan()](https://moodleformulas.org/course/view.php?id=31&section=16) | Arc tangent | Returns the inverse tangent or arctangent of the argument as a number (radian angle). |
|  | [atan2()](https://moodleformulas.org/course/view.php?id=31&section=18) | Arc tangent of the quotient of the arguments | Returns the inverse tangent or arctangent of the quotient of its arguments, expr0/expr1, as a number (radian angle). |
|  | [cos()](https://moodleformulas.org/course/view.php?id=31&section=21) | Cosine | Returns the cosine of the argument as a number (radian angle). Returns a numeric value between -1 and 1. |
|  | [sin()](https://moodleformulas.org/course/view.php?id=31&section=54) | Sine | Returns the sine of the argument as a number (radian angle). Returns a numeric value between -1 and 1. |
|  | [tan()](https://moodleformulas.org/course/view.php?id=31&section=61) | Tangent | Returns the tangent of the argument as a number (radian angle). |
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| **Hyperbolic functions** | [acosh()](https://moodleformulas.org/course/view.php?id=31&section=13) | Inverse hyperbolic cosine | Returns the inverse hyperbolic cosine of the argument as a number. Value of x must be greater than or equal to 1. |
|  | [asinh()](https://moodleformulas.org/course/view.php?id=31&section=15) | Inverse hyperbolic sine | Returns the inverse hyperbolic sine of the argument as a number. Domain is the whole real line. |
|  | [atanh()](https://moodleformulas.org/course/view.php?id=31&section=17) | Inverse hyperbolic tangent | Returns the inverse hyperbolic tangent of the argument as a number. Domain is the open interval (-1, 1). |
|  | [cosh()](https://moodleformulas.org/course/view.php?id=31&section=22) | Hyperbolic cosine | Returns the hyperbolic cosine of the argument as a number. |
|  | [sinh()](https://moodleformulas.org/course/view.php?id=31&section=55) | Hyperbolic sine | Returns the hyperbolic sine of the argument as a number. |
|  | [tanh()](https://moodleformulas.org/course/view.php?id=31&section=62) | Hyperbolic tangent | Returns the hyperbolic tangent of the argument as a number. |
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| **Combinatoric functions** | [inv()](https://moodleformulas.org/course/view.php?id=31&section=32) | Inverse permutation | Returns the inverse permutation (permutation in which each number and the number of the place which it occupies is exchanged) of the argument.     * list0 = list of numeric expressions whose values when truncated start at 0 & increase by 1   e.g. list0=[2,7,4,9,8,3,5,0,6,1]; inv(list0) ⇒ [7,9,0,5,2,6,8,1,4,3] |
|  | [ncr()](https://moodleformulas.org/course/view.php?id=31&section=45) | Number of combinations | Returns the number of combinations of n objects taken r at a time (combination without repetition)     * n = total number of objects * r = sample size |
|  | [npr()](https://moodleformulas.org/course/view.php?id=31&section=46) | Number of permutations | Returns the number of permutations of n objects taken r at a time (permutation without repetition).     * n & r must be integers |
| **Algebraic and other numerical functions** | [abs()](https://moodleformulas.org/course/view.php?id=31&section=11) | Absolute value | Returns the absolute value of the argument as a number. |
|  | [ceil()](https://moodleformulas.org/course/view.php?id=31&section=19) | Ceiling | Returns the smallest integer greater than or equal to the argument. |
|  | [deg2rad()](https://moodleformulas.org/course/view.php?id=31&section=23) | Degrees to radians | Returns the value of the argument converted from degrees to radians, as a number.  **Tip:** To make a degree sign (°) on a Windows computer, press and hold the Alt key and type 0176, not 176, on the number keypad. |
|  | [exp()](https://moodleformulas.org/course/view.php?id=31&section=25) | Exponential | Returns the exponential of the argument as a number. |
|  | [expm1()](https://moodleformulas.org/course/view.php?id=31&section=26) | Exponential - 1 | Returns the exponential of the argument minus one, as a number, computed in a way that is accurate even when the value of the argument is close to zero. |
|  | [fact()](https://moodleformulas.org/course/view.php?id=31&section=27) | Factorial | Returns the factorial of the argument as a number (factorial of a non-negative integer n, denoted by n!, is the product of all positive integers less than or equal to n). |
|  | [floor()](https://moodleformulas.org/course/view.php?id=31&section=29) | Floor | Returns the greatest integer less than or equal to the argument. |
|  | [fmod()](https://moodleformulas.org/course/view.php?id=31&section=30) | Modulo | Returns the floating-point remainder (modulo) of the quotient of its arguments as a number. |
|  | [gcd()](https://moodleformulas.org/course/view.php?id=31&section=31) | Greatest common divisor | Returns the greatest common divisor of the two arguments as a number.     * expr0 & expr1 must be integer values |
|  | [is\_finite()](https://moodleformulas.org/course/view.php?id=31&section=33) | Is finite | Determines whether the argument is a finite number. Return value = 0 if false & = 1 if true. |
|  | [is\_infinite()](https://moodleformulas.org/course/view.php?id=31&section=34) | Is infinite | Determines whether the value of the argument is infinite. |
|  | [is\_nan()](https://moodleformulas.org/course/view.php?id=31&section=35) | Is not a number | Determines whether the value of the argument is not a number. |
|  | [lcm()](https://moodleformulas.org/course/view.php?id=31&section=37) | Least common multiple | Returns the least common multiple of the two arguments as a number.     * expr0 & expr1 must be integer values |
|  | [log()](https://moodleformulas.org/course/view.php?id=31&section=39) | Natural logarithm or logarithm in specified base | Returns the natural logarithm of the argument.  OR |
|  | [log10()](https://moodleformulas.org/course/view.php?id=31&section=40) | Base-10 logarithm | Returns the base-10 logarithm of the argument. |
|  | [log1p()](https://moodleformulas.org/course/view.php?id=31&section=41) | Natural logarithm of 1 plus the argument | Returns the natural logarithm of (1 + expr0), as a number. |
|  | [max()](https://moodleformulas.org/course/view.php?id=31&section=43) | Highest value | Returns the argument with the largest numeric value. |
|  | [min()](https://moodleformulas.org/course/view.php?id=31&section=44) | Smallest value | Returns the argument with the smallest numeric value. |
|  | [pi()](https://moodleformulas.org/course/view.php?id=31&section=47) | *π* | Returns the value of π (=3.14159...). No argument for this function. |
|  | [poly()](https://moodleformulas.org/course/view.php?id=31&section=49) | Polynomial | Displays in TEX format the polynomial of variable exprX with constant coefficients expr0, expr1, expr2, ..., ordered according to the decreasing powers of exprX.     * exprX = variable of the polynomial (string expression) * expr2, expr1, expr0 = coefficients of the polynomial (numeric expressions) |
|  | [pow()](https://moodleformulas.org/course/view.php?id=31&section=50) | Power | Returns expr0 raised to the power expr1, that is, expr0expr1. |
|  | [rad2deg()](https://moodleformulas.org/course/view.php?id=31&section=51) | Radians to degrees | Returns the value of the argument converted from radians to degrees, as a number. |
|  | [round()](https://moodleformulas.org/course/view.php?id=31&section=52) | Round | Returns the rounded value of the argument as a number. |
|  | [sigfig()](https://moodleformulas.org/course/view.php?id=31&section=53) | Significant figures | Returns the rounded value of the first argument rounded to the number of significant figures specified by the second argument.     * expr0 = numeric expression giving value to be rounded * expr1 = numeric expression giving number of significant figures (must be >1) * string = expr0 rounded to the expr1 number of significant figures |
|  | [sqrt()](https://moodleformulas.org/course/view.php?id=31&section=57) | Square root | Returns the square root of the argument as a number. |
|  | [trunc](https://moodleformulas.org/course/view.php?id=31&section=63) | Truncation | NOT a built-in function of the Formulas question. Can get the same result from: |
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| **String and array functions** | [concat()](https://moodleformulas.org/course/view.php?id=31&section=20) | Concatenation | Returns the concatenated arguments as a list of numbers or a list of strings. |
|  | [diff()](https://moodleformulas.org/course/view.php?id=31&section=24) | Difference | Returns the difference between list0 and list1 element wise, as a list of numbers.    e.g. Text  Description automatically generated with medium confidence |
|  | [fill()](https://moodleformulas.org/course/view.php?id=31&section=28) | Fill | Returns a list with size number and all elements filled by the value of expr0.     * number = size of list * expr0 = numeric expression or string expression |
|  | [join()](https://moodleformulas.org/course/view.php?id=31&section=36) | Join | Returns a string that joins all elements together, separated by expr0.  e.g. |
|  | [len()](https://moodleformulas.org/course/view.php?id=31&section=38) | Length | Returns the length of the argument as a number. |
|  | [map()](https://moodleformulas.org/course/view.php?id=31&section=42) | Map | Returns a list by applying the operator/function element wise to all elements in X or Y.  A picture containing text  Description automatically generated   * uop or bop = unary or binary operators |
|  | [pick()](https://moodleformulas.org/course/view.php?id=31&section=48) | Pick | Returns the exprNth expression from the expr0, expr1, ... arguments.       * exprN = index which can be any integer or real value * expr0, expr1, expr2 = elements that can be all numeric expressions or all string expressions |
|  | [shuffle()](https://moodleformulas.org/course/view.php?id=31&section=64) | Shuffle | Randomizes the order of the elements in list0 and returns the shuffled list as list1.     * Can only be used in the random variables field |
|  | [sort()](https://moodleformulas.org/course/view.php?id=31&section=56) | Sort | Returns the sorted list of X in ascending order.    Returns the sorted list of X in order of list Y. |
|  | [str()](https://moodleformulas.org/course/view.php?id=31&section=58) | String | Converts the number into a string. |
|  | [sublist()](https://moodleformulas.org/course/view.php?id=31&section=59) | Sublist | Returns a sublist R of X using list Y as index, where R[i] = X[Y[i]]. |
|  | [sum()](https://moodleformulas.org/course/view.php?id=31&section=60) | Sum | Returns the sum of all elements in the list of numbers. |