

Answer on Question #45128 – Math – Multivariable Calculus

Find the domain of function f and evaluate $f(3,2)$.

$$f(x,y) = \{(x+y+1).5\}/(x-1)$$

Solution:

The fractional part sawtooth function, denoted by $\{x\}$ for real x , is defined by the formula

$$\{x\} = x - \lfloor x \rfloor$$

where $\lfloor x \rfloor$ is the largest integer not greater than x . For all x , $0 \leq \{x\} < 1$.

The domain is all the values that x and y is allowed to take on. The problems with this function are that not to divide by zero and the expression $(x+y+1).5$ has sense. the denominator equal to zero when $x=1$. The expression $(x+y+1).5$ has sense if $(x+y+1)$ is an integer number. So expression $(x+y+1).5$ make sense if for any real x and $y = k - \{x\}$, where k -is any integer number.

Hence domain of function $f(x,y) = \{(x+y+1).5\}/(x-1)$ is pairs (x, y) where x is any real not equal 1 and $y = k - \{x\}$, where k -is any integer number.

$$f(3,2) = f(x,y) = \{(3+2+1).5\}/(3-1) = \{6.5\}/2 = 0.5/2 = 0.25$$