

CHAPTER XXIV

VARIABLES AND LIMITS

400. Functions (§ 292) are usually denoted by symbols of the form $f(x)$, $P(x)$, $F(x)$, etc., and are read *f function of x*, *P function of x*, etc.

Thus, $f(x)$ comprises all expressions which involve the letter x , and it may represent in one discussion $3x^2 + 2x + 1$, in another \sqrt{x} , in a third $4^x + 2x^3$, etc.

401. If $f(x)$ is known in any particular discussion, $f(a)$ is formed by substituting a in place of x .

E.g. If $f(x) = 2x^2 + 2x + 3$,
then $f(3) = 2 \cdot 3^2 + 2 \cdot 3 + 3 = 27$,
 $f(a) = 2a^2 + 2a + 3$,
 $f(0) = 0 + 0 + 3 = 3$, etc.

402. If $y = f(x)$, x is called the **independent variable**, and y the **dependent variable**.

403. Similarly, $f(x, y)$ denotes a function of two independent variables. Thus, $x^2 + 3xy + y^2$, or $\sqrt{x} + \sqrt{y}$, or $\frac{x}{y}$, may be represented by the symbol $f(x, y)$.

E.g. If $f(x, y) = xy + x$, $f(2, 3) = 2^3 + 2 = 10$.

EXERCISE 142

1. If $f(x) = x^2 + 3x + 2$, find $f(1)$, $f(0)$, $f(-1)$.
2. If $f(x) = 5x^3 - 2x - 3$, find $f(2)$, $f(a)$, $f(0)$.
3. If $f(x) = 4^x$, find $f(0)$, $f(-1)$, $f(\frac{1}{2})$.