

$$\text{if } f(x) = \frac{ax + b}{x^2 - 1}$$

* Well, first of all, we have 2 unknowns (a) and (b).

Second, at $x = 3$, $f(3) = 1 \dots \dots$ GIVEN.

Solution:

$$1 = \frac{a(3) + b}{(3)^2 - 1}, \quad \dots \quad 8 = 3a + b \dots \text{eq. 1'}$$

And also, we know that there is a local value at $x=3$

We will derive the function and then equal to zero" because it is a local value at $x=3$ "

$$f'(x) = \frac{a(x^2 - 1) - 2x(ax + b)}{(x^2 - 1)^2} = 0, \quad \text{at } x = 3$$

$$a(x^2 - 1) - 2ax^2 - 2bx = 0$$

$$8a - 18a - 6b = 0$$

$$-10a - 6b = 0 \dots \dots \text{eq. 2'}$$

From eq.1 and eq.2

$$a = 6, \quad b = -10$$

$$f(x) = \frac{6x - 10}{x^2 - 1}$$

x	2	3	4
F(x)	2/3	1	14/15

From the data in the table,

At $x = 3$, maximum local value.