Basic Differentiation Rules:

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  | 18. |
| 19. | 20. | 21. |
| 22. | 23. | 24. |

**EXAMPLE 3:**

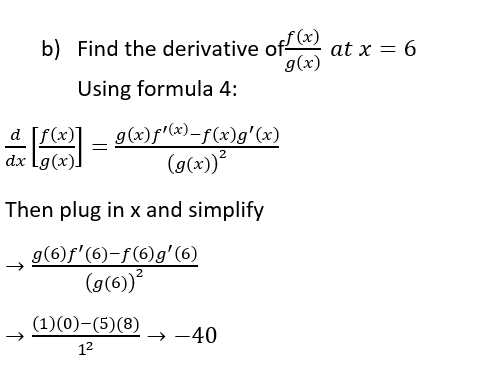
Tabular Data!

|  |  |  |
| --- | --- | --- |
| x | 2 | 6 |
|  | 3 | 5 |
|  | -1 | 0 |
|  | 2 | 1 |
|  | 6 | 8 |

1. Find the derivative of

Using formula 3:

Then plug in x and simplify



## Implicit Differentiation

Functions expressed in terms of another variable are *explicit*. These are simpler equations like , where y can is isolated. Sometimes functions may be given in *implicit* form like, where is *implied.* Sometimes however, y cannot be isolated and must remain in *implicit* form, such as. In this case, *implicit differentiation* can be used to differentiate the equation.

Steps for implicit differentiation:

|  |  |
| --- | --- |
| Step 1 | Differentiate both sides with respect to x |
| Step 2 | Isolate all terms involving to one side |
| Step 3 | Factor out |
| Step 4 | Isolate by dividing out the inner terms |
| Step 5 | If y could be isolated originally, substitute it into the current equation |

**EXAMPLE 4:**

Find of

Step 1: Differentiate both sides with respect to x

Step 2: Group all terms to one side

Step 3: Pull out

Step 4: Isolate

Step 5: We can’t substitute y here because it was not isolatable in the original equation