By Daniil Pshenichni, @dapshen, rid.team

Defi DEX AMM Classic Standart V2 Liquidity Pools, How they work? (PancakeSwap, SushiSwap, Uniswap).

Variables:

|  |  |
| --- | --- |
| A – Token A(or supply) | B – Token B(or supply) |
| C – reserve of token “A” in LP | D – reserve of token “B” in LP |
| E – “A” tokens bought by swap | F – “B” tokens bought by swap |
| G – “A” tokens sold by swap | H – “B” tokens sold by swap |
| I – Price of token “A” in token “B” | J – Price of token “B” in token “A” |
| K – Constant number (We need it for price and liquidity formulas, it is constant till someone adds/removes some LP) | L – LP tokens(LP tokens minted at the start of creating pool, or when someone adds/removes them) |
| M – Market Cap of token “A” in token “B” | N – Market Cap of token “B” in token “A” |

Formulas:

|  |  |
| --- | --- |
| K = C \* D | L = √K |
| Amount of token “B” bought(F),  while selling amount of token “A”(G):  F = D – (K / (C + G)) | Amount of token “A” bought(E),  while selling amount of token “B”(H):  E = C – (K / (D + H)) |
| Amount of token “A” needed to sell(G),  to buy amount of token “B”(F):  G = (K / (D – F)) – C | Reverse Calculation | Amount of token “B” needed to sell(H),  to buy amount of token “A”(E):  H = (K / (C – E)) – D | Reverse Calculation |
| Price of token “A” in token “B”(I):  I = D / C | Price of token “B” in token “A”(J):  J = C / D |
| Market Cap of token “A” in token “B”(M):  M = I \* A | Market Cap of token “B” in token “A”(N):  N = J \* B |