$B = 1$

(ii) For $x = -2$, we get

$3(-2) = A(-2 - 1) + B(-2 + 2)$

$-6 = -3A$

$A = 2$

Practice Question.

$\frac{3x}{(x+2)(x-4)} = \frac{A}{(x+2)} + \frac{B}{(x-4)}$

Multiply throughout by the Lowest Common Denominator $(x + 2)(x - 4)$.

The following is what is actually happening.

$$(x + 2)(x - 4)\left[\frac{3x}{(x + 2)(x - 4)}\right] = (x + 2)(x - 4)\left[\frac{A}{x + 2} + \frac{B}{x - 4}\right]$$

*$(x + 2)(x - 4)$ will cancel out, leaving 3x.

$3x = A(x - 4) + B(x + 2)$

METHOD 1

$3x = Ax - 4A + Bx + 2B$

$3x = Ax + Bx - 4A + 2B$

$3x + 0 = (A + B)x - 4A + 2B$ ←matching common terms where 4A+2B is a constant term to match 3x+0.

$3x + 0 = (A + B)x$ are coefficients of x where 0 is a constant term.

Hence, corresponding system of equations to be solved is:

*$A + B = 3$.....eq'n 1

$-4A + 2B = 0$.....eq'n 2

*coefficient of (A+B)x = 3x

Solving by substitution method by re-writing eq'n 1 as $A = 3 - B$.

Now substituting into eq'n 2.

$4(3 - B) + 2B.$

$12 + 4B + 2B = 0.$