Fracciones Parciales

2019-11-01

(1) a) $\dfrac{x - 20}{x^2 + x - 20}$

$(x + 5)(x - 4)$

$$x - 20 = \frac{A}{x + 5} + \frac{B}{x - 4}$$

b) $\dfrac{x^2}{x^2 + x + 20} = 1 + \dfrac{-x - 20}{x^2 + x + 20}$

(2) a) $\dfrac{x^4 - 2x^3 + x^2 + 3x - 1}{x^2 - 2x + 1}$

(8) $\int \frac{3}{(x+a)(x+b)}\,dx =$

$$\frac{3}{(x+a)(x+b)} = \frac{A}{x+a} + \frac{B}{x+b}$$

$$3 = A(x+b) + B(x+a)$$

$$3 = Ax + Ab + Bx + Ba$$

$$3 = Ax + Bx + Ab + Ba$$

$$0x + 3 = (A+B)x + Ab + Ba$$

$A + B = 0$

$A = -B$

$A = -\frac{3}{a-b}$

$Ab + Ba = 3$

$-Bb + Ba = 3$

$B(a-b) = 3$

$B = \frac{3}{a-b}$

$$\int \frac{\left(-\frac{3}{a-b}\right)}{x+a}\,dx = -\frac{3}{a-b}\int \frac{1}{x+a}\,dx$$

$u = x + a$

$$\boxed{-\frac{3}{a-b}\ln|x+a|}$$

$$\frac{3}{a-b}\int \frac{dx}{x+b} = \boxed{\frac{3}{a-b}\ln|x+b|}$$