Ejemplo 180

Descomponga a $Q(x) = \dfrac{2}{(x-3)(x+5)(3x+2)}$ *en fracciones parciales simples*

1) Escribir como $\dfrac{A}{(x-3)} + \dfrac{B}{(x+5)} + \dfrac{C}{(3x+2)}$

2) Maximo comun denominador $2 = A(x+5)(3x+2) + B(x-3)(3x+2) + C(x-3)(x+5)$

3) Sacar ceros

$x+5$	$3x+2$	$x-3$
$x=-5$	$x=-\frac{2}{3}$	$x=3$

$x=-5 \rightarrow A(-5+5)(3(-5)+2) + B(-5-3)(3(-5)+2) + C(-5-3)(-5+5)$

$A(0)(-13) + B(-8)(-13) + C(-8)(0)$

$0 + B(104) + 0$

$2 = 104B$

$B = \frac{1}{52}$

$x=-\frac{2}{3}$ Remplazando y despejando $x=3$

$2 = -\frac{793}{9}C$

$\frac{-18}{793} = C$

$A = \frac{1}{44}$

R/ $\dfrac{2}{(x-3)(x+5)(3x+2)} = \dfrac{\frac{1}{44}}{(x-3)} + \dfrac{\frac{1}{52}}{(x+5)} - \dfrac{\frac{18}{793}}{(3x+2)}$

Ejercicio 21

Realice la descomposición en fracciones parciales de $P(x) = \dfrac{17x-5}{5x^2-4x-1}$

$$\frac{17x-5}{5x^2-4x-1} \qquad \frac{17x-5}{(5x+1)(x-1)}$$

$$5x - 1 = x \qquad \frac{A}{(5x+1)} + \frac{B}{(x-1)}$$

$$1x - 1 = -5x$$

$$-4x$$

$$x = -\frac{1}{5} \qquad x = 1$$

$$17x - 5 = A(x-1) + B(5x+1)$$

$x = 1$

$$17(1) - 5 = A(0) + B(6)$$

$$12 = B(6)$$

$$\boxed{B = 2}$$

$x = -\frac{1}{5}$

$$17\left(-\frac{1}{5}\right) - 5 = A\left(-\frac{1}{5} - 1\right) + B\left(5\left(-\frac{1}{5}\right) + 1\right)$$

$$-\frac{42}{5} = A\left(-\frac{6}{5}\right) + B(0)$$

$$\boxed{A = 7}$$

R/ $$\frac{17x-5}{5x^2-4x-1} = \frac{7}{(5x+1)} + \frac{2}{(x-1)}$$