On bilgi: $x^2+bx+c=0$ nin kokleri x_1 ve x_2 ise $x^2+bx+c=(x-x_1)(x-x_2)$ seklinde yazilabilir.

x^2+3x+2	$x_1=-2$, $x_1=-1$	(x+2) x+1)
x^2+6x+5	$x_1=-5$, $x_1=-1$	(x+5) x+1)
x^2-3x+2	$x_1=2$, $x_1=1$	(x-2) x-1)
x^2-4	$x_1=-2$, $x_1=2$	(x+2) x-2)
x^2+2x+5	$x_1=-1+2i$, $x_2=-1-2i$	(x-(-1+2i)) (x-(-1-2i) (x+1-2i) (x+1+2i)
x^2-2x+5	$x_1=1+2i$, $x_2=1-2i$	(x-(1+2i)) (x-(1-2i) (x-1-2i) (x-1+2i)
x^2+4	$x_1=-2i$, $x_1=2i$	(x+2i) x-2i)

$x^2+bx+c=(x-x_1)(x-x_2)= x^2-(x_1+x_2)x+x_1x_2$

Buradan $b=-(x_1+x_2)$, $c=x_1x_2$,

(x+2) x+1) = (x-(-2)) (x-(-1)) = $x^2-(-2-1)+((-2)(-1)) = x^2+3x+2$

(x+1-2i) (x+1+2i) = [x-(-1+2i)] [x-(-1-2i)] = $x^2-(-1+2i-1-2i) + (-1-2i)(-1+2i) = x^2+2x+5$

P42

$$\frac{16x^3+42x^2-6x+72}{x^4+2x^3-11x^2+28x+40}=?$$

paydanin kokleri $x_1=-5$, $x_2=-1$, $x_3=2+2i$, $x_4=2-2i$ olarak veriliyor. Basit kesirlere ayirin.

Cozum.

Payda $(x-x_1)(x-x_2)(x-x_3)(x-x_4)=(x+5)(x+1)(x-2-2i)(x-2+2i)$ seklinde carpanlara ayrilabilir.

$$\frac{16x^3+42x^2-6x+72}{x^4+2x^3-11x^2+28x+40}=\frac{A}{x-2-2i}+\frac{B}{x-2+2i}+\frac{C}{x+5}+\frac{D}{x+1}$$

$$\frac{16x^3+42x^2-6x+72}{x^4+2x^3-11x^2+28x+40}=\frac{16x^3+42x^2-6x+72}{(x^2-4x+8)(x+5)(x+1)}$$

$$\frac{16x^3+42x^2-6x+72}{x^4+2x^3-11x^2+28x+40}=\frac{Ax+B}{(x^2-4x+8)}+\frac{C}{x+5}+\frac{D}{x+1}$$

Burada

$$C=\frac{16(-5)^3+42(-5)^2-6(-5)+72}{((-5)^2-4(-5)+8)(-5+1)}=4$$

$$D = \frac{16(-1)^3 + 42(-1)^2 - 6(-1) + 72}{((-1)^2 - 4(-1) + 8)(-1+5)} = 2$$

$$\frac{16x^3 + 42x^2 - 6x + 72}{x^4 + 2x^3 - 11x^2 + 28x + 40} = \frac{Ax+B}{(x^2 - 4x + 8)} + \frac{4}{x+5} + \frac{2}{x+1}$$

Ikinci taraf tek kesir halinde yazilirsa,

$$\frac{16x^3 + 42x^2 - 6x + 72}{x^4 + 2x^3 - 11x^2 + 28x + 40} =$$

$$\frac{(Ax+B)(x+5)(x+1) + 4(x^2 - 4x + 8)(x+1) + 2(x^2 - 4x + 8)(x+5)}{(x^2 - 4x + 8)(x+5)(x+1)}$$

Ikinci taraftaki islemler yapilir x^3, x^2, x ve sabit terimlerin katsayilari esitlenir.