

Exp. Find a value of k for which $9x^4 + kx^2y^3 + 25y^6$ is a perfect square

$$9x^4 + kx^2y^3 + 25y^6 = (3x^2)^2 + kx^2y^3 + (5y^3)^2$$

will be a perfect square $(3x^2 \pm 5y^3)^2$ - so

$$kx^2y^3 = 2(3x^2)(5y^3) = 30x^2y^3 \quad (\Rightarrow) \quad \boxed{k=30}$$

Exp. The coefficient of x^2 in the polynomial

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

$$(2x+3)(2x-3)(x-1)(x-1) = (4x^2-9)(x-1)(x-1)$$

$$= (4x^2-9)(x^2-2x+1) =$$

$$\text{The terms in } x^2 : 4x^2 - 9x^2 = \boxed{-5x^2}$$

The coeff is -5