

Multiplication of polynomials -

Law of exponents: $x^a \cdot x^b = x^{a+b}$ $(x^a)^b = x^{a \cdot b}$

Distributivity property: $\alpha(x+x_0) = \alpha \cdot x + \alpha \cdot x_0$

Product forms: $(a+b)^2 = a^2 + 2ab + b^2$

$(a-b)(a+b) = a^2 - b^2$

① Simplify $(5x-6)(2x-3)$

$$\begin{aligned}
 &= 5x(2x-3) - 6(2x-3) \\
 &= (5x)(2x) - (5x)(3) - 6(2x) - 6(-3) \\
 &= 10x^2 - 15x - 12x + 18 \\
 &= 10x^2 - 27x + 18
 \end{aligned}$$

② $(2x^2 + 3y^2)^2 = (2x^2)^2 + 2(2x^2)(3y^2) + (3y^2)^2$

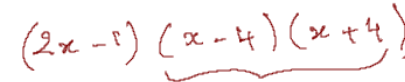
$$\begin{aligned}
 &= 2^2(x^2)^2 + 12x^2y^2 + 3^2(y^2)^2 \\
 &= 4x^4 + 12x^2y^2 + 9y^4
 \end{aligned}$$

③ $-2(2-6x)(-x-1) + 5x^2 - 10x + 3$



$$\begin{aligned}
 &= -2[2(-x) + 2(-1) - 6x(-x) - 6x(-1)] + 5x^2 - 10x + 3 \\
 &= -2[-2x - 2 + 6x^2 + 6x] + 5x^2 - 10x + 3 \\
 &= -8x + 4 - 12x^2 + 5x^2 - 10x + 3 \\
 &= -7x^2 - 18x + 7
 \end{aligned}$$

④ $(2x-1)(x-4)(x+4)$



$$\begin{aligned}
 &= (2x-1)(x^2-4) \\
 &= 2x \cdot x^2 - 32x - x^2 + 16 \\
 &= 2x^3 - x^2 - 32x + 16
 \end{aligned}$$