

# FACToring

1. GCF
2. Grouping
3. P-S-D
4. KEY NUMBER
5. DIFF. OF 2 SQUARES (2 TERMS WITH A MINUS BETWEEN THEM)
6. DIFF OF 2 CUBES (2 TERMS WITH A MINUS BETWEEN THEM)
7. SUM OF 2 CUBES (2 TERMS WITH A PLUS BETWEEN THEM)

$$\begin{aligned} \textcircled{1} \quad & x^2 - 49 \\ & (\underbrace{x}_F)^2 - (\underbrace{7}_L)^2 \\ & (F+L)(F-L) \\ & \boxed{(x+7)(x-7)} \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad & 9y^2 - 16 \\ & (3y)^2 - (4)^2 \\ & \boxed{(3y+4)(3y-4)} \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad & 48x^2 - 3y^2 \\ & 3(16x^2 - y^2) \\ & 3[(4x)^2 - (y)^2] \\ & \boxed{3(4x+y)(4x-y)} \end{aligned}$$

$$\begin{aligned} \textcircled{4} \quad & x^{10} - y^8 \\ & (x^5)^2 - (y^4)^2 \\ & \boxed{(x^5+y^4)(x^5-y^4)} \end{aligned}$$

$$\begin{aligned} \textcircled{5} \quad & 32x^2z - 2y^2z \\ & 2z(16x^2 - y^2) \\ & \boxed{2z(4x+y)(4x-y)} \end{aligned}$$

$$\begin{aligned} \textcircled{6} \quad & 9 - (2x-y)^2 \\ & (3)^2 - (2x-y)^2 \\ & (3+2x-y)(3-(2x-y)) \\ & \boxed{(3+2x-y)(3-2x+y)} \end{aligned}$$

$$\begin{aligned} \textcircled{7} \quad & x^4 - 16 \\ & (x^2)^2 - (4)^2 \\ & (x^2+4)(x^2-4) \\ & (x^2+4)[(x)^2 - (2)^2] \\ & \boxed{(x^2+4)(x+2)(x-2)} \end{aligned}$$

$$\begin{aligned} \textcircled{8} \quad & x^3 + 27 \\ & \text{SUM OF 2 CUBES} \\ & (\underbrace{x}_F)^3 + (\underbrace{3}_L)^3 \\ & (F+L)(F^2 - FL + L^2) \\ & (x+3)(x^2 - (x)(3) + 3^2) \\ & \boxed{(x+3)(x^2 - 3x + 9)} \end{aligned}$$

$$\begin{aligned} \textcircled{9} \quad & m^6 - 8n^3 \\ & \text{DIFF OF 2 CUBES} \\ & (\underbrace{m^2}_F)^3 - (\underbrace{2n}_L)^3 \\ & (F-L)(F^2 + FL + L^2) \\ & (m^2-2n)(m^2)^2 + (m^2)(2n) + (2n)^2 \\ & \boxed{(m^2-2n)(m^4 + 2m^2n + 4n^2)} \end{aligned}$$

$$\begin{aligned} \textcircled{10} \quad & 81x^3 + 24y^3 \\ & 3(27x^3 + 8y^3) \\ & 3[(\underbrace{3x}_F)^3 + (\underbrace{2y}_L)^3] \\ & (F+L)(F^2 - FL + L^2) \\ & 3(3x+2y)(3x)^2 - (3x)(2y) + (2y)^2 \\ & \boxed{3(3x+2y)(9x^2 - 6xy + 4y^2)} \end{aligned}$$