

## التحليل للعوامل

Exp Factor the following poly.

①  $\underbrace{3x^2}_{\text{مربع}} - \underbrace{x}_{\text{خط}} = \underbrace{x}_{\text{عامل مشترك}} [3x - 1]$  أبسط صورة

عامل مشترك  
Common factor  
monomial  
عوامل مشتركة  
عوامل مشتركة

②  $\boxed{-\frac{3}{3}x^2t - \frac{3}{3}x + \frac{9}{3}xt^2} = 3 \left[ -\frac{x^2}{x}t - \frac{x}{x} + 3\frac{x}{x}t^2 \right]$

$= 3x [-x + -1 + 3t^2]$   
عوامل مشتركة  
Common factor  
monomial  
عوامل مشتركة

③  $\frac{8}{4}a^2b - \frac{160}{4}x + \frac{4}{4}bx^2 = 4[2a^2b - 40x + bx^2]$

or  $= -4[-2a^2b + 40x - bx^2]$

عوامل مشتركة  
Common monomial factor  
عوامل مشتركة

Common

( factoring by grouping )

$$(4) \quad 3x - 3y + 7ax - 7ay$$

$$3[x - y] + 7a[x - y]$$

ليست أبسط

$$(x - y)(3 + 7a)$$

أبسط

Common binomial factor

$$(5) \quad x^2 - 7x + 6 = (x + a)(x + b)$$

$a = -6$   
 $b = -1$   
 $ab = 6$   
 $a + b = -7$

$$= (x - 6)(x - 1)$$

binomial  
binomial

في المعادلة التربيعية المثلثية هرقط تحليل المعادلة لنا يكون عدد  $x^2$  واحد

$$(6) \quad x^2 - 2x - 3 = (x + a)(x + b)$$
$$= (x - 3)(x + 1)$$

binomials

$$ab = -3$$
$$a + b = -2$$
$$a = -3, b = 1$$

$$\overbrace{a+b=-2}^{a+b=-2}$$

$$a=-3, b=1$$

binomials

(7)  $x^2 - 21x + 20 = (x + a)(x + b)$

$$= (x - 20)(x - 1)$$

$ab = 20$   
 $a + b = -21$

$a = -20$   
 $b = -1$

(8)  $x^2 - 16 = (x + a)(x + b)$

$$= (x - 4)(x + 4)$$

$ab = -16$   
 $a + b = 0$

$a = 4$   
 $a = -4$

$x - 4$  is conjugate to  $x + 4$   
 $x + 4 = = =$  to  $x - 4$

(9)  $y^2 - 3 = (y + a)(y + b)$

$$= (y + \sqrt{3})(y - \sqrt{3})$$

$ab = -3$   
 $a + b = 0$

$a = \sqrt{3}$   
 $b = -\sqrt{3}$

$y + \sqrt{3}$  is conjugate to  $y - \sqrt{3}$   
 $y - \sqrt{3} = = =$  to  $y + \sqrt{3}$

Exp Find conjugate of

(1)  $x + 1 \Rightarrow x - 1$

$$\textcircled{1} \quad x + 1 \Rightarrow x - 1$$

$$\textcircled{2} \quad 3x + 7 \Rightarrow 3x - 7$$

$$\textcircled{3} \quad \frac{1}{2} - \frac{\sqrt{3}}{2}y \Rightarrow \frac{1}{2} + \frac{\sqrt{3}}{2}y$$

Exp Factor completely مثلاً في هذه

① the binomial  $\underline{25x^2} - \underline{36y^2} = (5x)^2 - (6y)^2$

$$(5x + 6y)(5x - 6y)$$

$$\begin{array}{lcl} 5x + 6y & \text{is conjugate to} & 5x - 6y \\ 5x - 6y & \text{"} & \text{"} \end{array}$$

③ the trinomial  $-6 + x + x^2$

$$\begin{aligned} \text{ترتيب} \quad x^2 + x - 6 &= (x + a)(x + b) \\ &= (x + 3)(x - 2) \end{aligned}$$

$$\begin{array}{l} ab = -6 \\ a + b = 1 \end{array} \Rightarrow \begin{array}{l} a = 3 \\ b = -2 \end{array}$$

④  $3x - 6 = 3(x - 2)$   
أبسطه

أبسطه

عنه

عنه

(5)  $X^4 - 25 = (X^2 - 5)(X^2 + 5)$   
 $= (x - \sqrt{5})(x + \sqrt{5})(x^2 + 5)$

$ab = -5$   
 $a + b = 0$   
 $\rightarrow a = -\sqrt{5}$   
 $b = \sqrt{5}$

$X^2 + 5 = (x + a)(x + b)$

$ab = 5$   
 $a + b = 0$   
 $\rightarrow a = ?$   
 $b = ?$

(6)  $X^4 + 6X^2 + 9 = y^2 + 6y + 9$   
 $= (y + a)(y + b)$

$y = X^2 \Rightarrow y^2 = X^4$

$ab = 9$   
 $a + b = 6$   
 $\rightarrow a = 3$   
 $b = 3$

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

نعمل معادلة تربيعية

(7)  $X^8 + 2X^4 + 1 = y^2 + 2y + 1$

$ab = 1$

$a + b = 2$

$(y + a)(y + b)$

$$y = x^4 \Rightarrow y^2 = x^8$$

$$\begin{aligned}
 &= (y+a)(y+b) \\
 &= (y+1)(y+1) \\
 &= (y+1)^2 \\
 &= (x^4+1)^2
 \end{aligned}$$

$$a+b=2$$

(8)  $x^6 + 5x^3 + 4 = y^2 + 5y + 4$

$$\begin{aligned}
 &= (y+1)(y+4) \\
 &= (x^3+1)(x^3+4)
 \end{aligned}$$

$y = x^3 \Rightarrow y^2 = x^6$