

7.4 444  
P

$$\textcircled{1} x^2 - 25 = (x-5)(x+5)$$

$$\textcircled{3} y^2 - 1 = (y-1)(y+1)$$

$$\textcircled{5} 4x^2 - 9 = (2x-3)(2x+3)$$

$$\textcircled{7} 25 - x^2 = (5-x)(5+x)$$

$$\textcircled{9} 1 - 49x^2 = (1-7x)(1+7x)$$

$$\textcircled{11} 9 - 25y^2 = (3-5y)(3+5y)$$

$$\textcircled{13} x^4 - 9 = (x^2-3)(x^2+3)$$

$$\textcircled{15} 49y^4 - 16 = (7y^2-4)(7y^2+4)$$

$$\textcircled{17} x^{10} - 9 = (x^5-3)(x^5+3)$$

$$\textcircled{19} 25x^2 - 16y^2 = (5x-4y)(5x+4y)$$

$$\textcircled{21} x^4 - y^{10} = (x^2-y^5)(x^2+y^5)$$

$$\textcircled{23} x^4 - 16 = (x^2-4)(x^2+4) = (x-2)(x+2)(x^2+4)$$

$$\textcircled{25} 16x^4 - 81 = (4x^2-9)(4x^2+9) = (2x-3)(2x+3)(4x^2+9)$$

$$\textcircled{27} 2x^2 - 18 = 2(x^2-9) = 2(x-3)(x+3)$$

$$\textcircled{29} 2x^3 - 72x = 2x(x^2-36) = 2x(x-6)(x+6)$$

$$\textcircled{31} x^2 + 36 \text{ prime}$$

$$\textcircled{33} 3x^3 + 27x = 3x(x^2+9)$$

$$\textcircled{35} 18 - 2y^2 = 2(9-y^2) = 2(3-y)(3+y)$$

$$\textcircled{37} 3y^3 - 48y = 3y(y^2-16) = 3y(y-4)(y+4)$$

$$\textcircled{39} 18x^3 - 2x = 2x(9x^2-1) = 2x(3x-1)(3x+1)$$

$$\textcircled{41} x^2 + 2x + 1 = (x+1)^2$$

(P)

(43)  $x^2 - 14x + 49$   
 $= (x-7)^2$

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

(47)  $x^2 + 22x + 121$   
 $= (x+11)^2$

(49)  $4x^2 + 4x + 1$   
 $= (2x+1)^2$

(51)  $25y^2 - 10y + 1$   
 $= (5y-1)^2$

(53)  $x^2 - 10x + 100$   
 $\boxed{\text{prime}}$

(55)  $x^2 + 14xy + 49y^2$   
 $= (x+7y)^2$

(57)  $x^2 - 12xy + 36y^2$   
 $= (x-6y)^2$

(59)  $x^2 - 8xy + 64y^2$   
 $\boxed{\text{prime}}$

(61)  $16x^2 - 40xy + 25y^2$   
 $= (4x-5y)^2$

(63)  $12x^2 - 12x + 3$   
 $= 3(4x^2 - 4x + 1)$   
 $= 3(2x-1)^2$

(65)  $9x^3 + 6x^2 + x$   
 $= x(9x^2 + 6x + 1)$   
 $= x(3x+1)^2$

(67)  $2y^2 - 4y + 2$   
 $= 2(y^2 - 2y + 1)$   
 $= 2(y-1)^2$

(69)  $2y^3 + 28y^2 + 98y$   
 $= 2y(y^2 + 14y + 49)$   
 $= 2y(y+7)^2$

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

(73)  $x^3 - 27$   
 $= (x-3)(x^2 + 3x + 9)$

(75)  $8y^3 - 1$   
 $= (2y-1)(4y^2 + 2y + 1)$

(77)  $27x^3 + 8$   
 $= (3x+2)(9x^2 - 6x + 4)$

(79)  $x^3y^3 - 64$   
 $= (xy-4)(x^2y^2 + 4xy + 16)$

(81)  $27y^4 + 8y$   
 $= y(27y^3 + 8)$   
 $= y(3y+2)(9y^2 - 6y + 4)$

$$\textcircled{83} \quad 54 - 16y^3$$

$$= 2(27 - 8y^3)$$

$$= 2(3 - 2y)(9 + 6y + 4y^2)$$

$$\textcircled{85} \quad 64x^3 + 27y^3$$

$$= (4x + 3y)(16x^2 - 12xy + 9y^2)$$

$$\textcircled{87} \quad 125x^3 - 64y^3$$

$$= (5x - 4y)(25x^2 + 20xy + 16y^2)$$

$$\textcircled{89} \quad 25x^2 - \frac{4}{49}$$

$$= \left(5x - \frac{2}{7}\right)\left(5x + \frac{2}{7}\right)$$

$$\textcircled{91} \quad y^4 - \frac{y}{1000}$$

$$= y\left(y^3 - \frac{1}{1000}\right)$$

$$= y\left(y - \frac{1}{10}\right)\left(y^2 - \frac{y}{10} + \frac{1}{100}\right)$$

$$\textcircled{93} \quad 0.25x - x^3$$

$$= x(0.25 - x^2)$$

$$= x(0.5 - x)(0.5 + x)$$

$$\textcircled{95} \quad (x+1)^2 - 25$$

$$= ((x+1) - 5)((x+1) + 5)$$

$$= (x-4)(x+6)$$

$$\textcircled{97}$$

$$\begin{array}{r} x^2 + 2x + 1 \\ x-3 \overline{) x^3 - x^2 - 5x - 3} \\ \underline{-(x^3 - 3x^2)} \phantom{- 3} \\ 2x^2 - 5x \phantom{- 3} \\ \underline{-(2x^2 - 6x)} \phantom{- 3} \\ x - 3 \end{array}$$

hence  $x^3 - x^2 - 5x - 3$

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

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