

$$\text{Ex1} \quad (x+2)(x+3)(x+4)$$

$$(x+2)(x+3)$$

$$= x^2 + 2x + 3x + 6$$

$$= x^2 + 5x + 6$$

$$(x^2 + 5x + 6)(x+4)$$

$$= \begin{array}{r} x^3 + 5x^2 + 6x \\ + 4x^2 + 20x + 24 \\ \hline \end{array}$$

$$= x^3 + 9x^2 + 26x + 24$$

$$(x+3)(x+4)$$

$$= x^2 + 3x + 4x + 12$$

$$= x^2 + 7x + 12$$

$$(x^2 + 7x + 12)(x+2)$$

$$= \begin{array}{r} x^3 + 7x^2 + 12x \\ + 2x^2 + 14x + 24 \\ \hline \end{array}$$

$$= x^3 + 9x^2 + 26x + 24$$

$$\text{Ex2} \quad (x+1)(x+2)(x+5)$$

$$(x+1)(x+2)$$

$$= x^2 + x + 2x + 2$$

$$= x^2 + 3x + 2$$

$$(x^2 + 3x + 2)(x+5)$$

$$= \begin{array}{r} x^3 + 3x^2 + 2x \\ + 5x^2 + 15x + 10 \\ \hline \end{array}$$

$$= x^3 + 8x^2 + 17x + 10$$

$$\text{Ex3} \quad (x+2)(x+2)(x+1)$$

$$(x+2)(x+2)$$

$$= x^2 + 2x + 2x + 4$$

$$= x^2 + 4x + 4$$

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

$$= \begin{array}{r} x^3 + 4x^2 + 4x \\ + x^2 + 4x + 4 \\ \hline \end{array}$$

$$= x^3 + 5x^2 + 8x + 4$$

Exercise

$$1) (x+5)(x+4)(x+1)$$

$$(x+5)(x+4)$$

$$= x^2 + 5x + 4x + 20$$

$$= x^2 + 9x + 20$$

$$(x^2 + 9x + 20)(x+1)$$

$$= \begin{array}{r} x^3 + 9x^2 + 20x \\ + x^2 + 9x + 20 \end{array}$$

$$= x^3 + 10x^2 + 29x + 20$$

$$3) (x+3)(x+3)(x+2)$$

$$(x+3)(x+3)$$

$$= x^2 + 3x + 3x + 9$$

$$= x^2 + 6x + 9$$

$$(x^2 + 6x + 9)(x+2)$$

$$= \begin{array}{r} x^3 + 6x^2 + 9x \\ + 2x^2 + 12x + 18 \end{array}$$

$$= x^3 + 8x^2 + 21x + 18$$

$$2) (x+1)(x+1)(x+1)$$

$$(x+1)(x+1)$$

$$= x^2 + x + x + 1$$

$$= x^2 + 2x + 1$$

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

$$= \begin{array}{r} x^3 + 2x^2 + x \\ + x^2 + 2x + 1 \end{array}$$

$$= x^3 + 3x^2 + 3x + 1$$

$$4) x(x+2)(x+3)$$

$$x(x+2)$$

$$= x^2 + 2x$$

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

$$= \begin{array}{r} x^3 + 2x^2 \\ + 3x^2 + 6x \end{array}$$

$$= x^3 + 5x^2 + 6x$$

Ex 4

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

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

$$= x^2 - 3x + 2x - 6$$

$$= x^2 - x - 6$$

$$(x^2 - x - 6)(x-1)$$

$$= \begin{array}{r} x^3 - x^2 - 6x \\ -x^2 + x + 6 \\ \hline \end{array}$$

$$= x^3 - 2x^2 - 5x + 6$$

Ex 5

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

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

$$= 4x^2 + 6x + 2x + 3$$

$$= 4x^2 + 8x + 3$$

$$(4x^2 + 8x + 3)(x-2)$$

$$= \begin{array}{r} 4x^3 + 8x^2 + 3x \\ -8x^2 - 16x - 6 \\ \hline \end{array}$$

$$= 4x^3 - 13x - 6$$