

Multiplying Polynomials

ex multiply

$$a) -2x^3 \cdot 4x$$

$$-2 \cdot 4 x^3 x^1$$

$$-8x^4$$

$$b) 3a(a^2 - 4a)$$

$$3a a^2 - 3a \cdot 4a$$

$$3a^3 - 12a^2$$

$$c) (3r - 4)(2r + 1)$$

$$6r^2 + 3r - 8r - 4$$

$$6r^2 - 5r - 4$$

$$a^2 \cdot a^3 = a^5$$
$$(a \cdot a) \cdot (a \cdot a \cdot a) = a^5$$
$$a^m \cdot a^n = a^{m+n}$$

First
Outer
Inner
Last

$$d) (a+3)(a^2-4a+2)$$

$$a^3 - 4a^2 + 2a + 6$$

$$+ 3a^2 - 12a$$

$$a^3 - a^2 - 10a + 6$$

$$e) (3x-4)^2$$

$$(3x-4)(3x-4)$$

$$9x^2 - 12x - 12x + 16$$

$$9x^2 - 24x + 16$$

$$\star (A+B)^2 = A^2 + 2AB + B^2$$

$$\star (A-B)^2 = A^2 - 2AB + B^2$$

$$(A-B)(A-B)$$

$$= A^2 - 1AB - 1AB + B^2$$

$$= A^2 - 2AB + B^2$$

$$9x^2 - 24x + 16$$

$$f) (3x+y)(3x-y) - (2x+y)^2$$

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

$$9x^2 - (y^2) - 4x^2 - 4xy - (y^2)$$

$$9x^2 - 2y^2 - 4x^2 - 4xy$$

$$5x^2 - 2y^2 - 4xy$$

$$(A+B)^2 = A^2 + 2AB + B^2$$

$$(2x+y)^2 = 4x^2 + 4xy + y^2$$

$$A = 2x$$

$$B = y$$

You Try It!

① $(2a+3)(4a-1)$

$$8a^2 + 10a - 3$$

② $(t+4)(t+1)(t-2)$

$$(t^2 + 5t + 4)(t-2)$$

$$t^3 - 2t^2 - 10t - 8$$

$$+ 5t^2 + 4t$$

$$\begin{array}{r} +5t^2 + 4t \\ \hline t^3 + 3t^2 - 6t - 8 \end{array}$$

Answers

$$\textcircled{1} \quad 8a^2 + 10a - 3$$

$$\textcircled{2} \quad t^3 + 3t^2 - 6t - 8$$