1. Evaluación 1ºD - Funciones

Ejercicio 1: Realiza las siguientes sumas de polinomios:

[1] $4\,x^5 - x^4 + 4\,x + -x + 4\,x^6 + x^3 - x = 4\,x^6 + 4\,x^5 - x^4 + x^3 + 2\,x$

[2] $3\,x^4 + x^2 - 3\,x + 2\,x^4 - 2\,x + -2\,x^5 + 7\,x = -2\,x^5 + 5\,x^4 + x^2 + 2\,x$

[3] $4\,x^5 - 3\,x^3 - x^2 + x^5 + 2\,x^2 + x^6 + 3\,x^4 + 4\,x^3 = x^6 + 5\,x^5 + 3\,x^4 + x^3 + x^2$

[4] $x^6 + 3\,x^2 - 3\,x + -2\,x^6 - 3\,x^4 + -x^3 - 2\,x^2 + 2\,x = -x^6 - 3\,x^4 - x^3 + x^2 - x$

[5] $-3\,x^4 - 4\,x^3 - x + (-x^2 - x) + (-2\,x^6 - x^5) = -2\,x^6 - x^5 - 3\,x^4 - 4\,x^3 - x^2 - 2\,x$

[6] $3\,x^4 + 6\,x + -4\,x^6 + 2\,x^5 - 2\,x^4 + -4\,x^5 + 2\,x^3 + x^2 = -4\,x^6 - 2\,x^5 + x^4 + 2\,x^3 + x^2 + 6\,x$

[7] $2\,x^3 + 3\,x^2 - x + 3\,x^5 - x^4 + 4\,x^2 + 3\,x^6 + 3\,x^3 + 4\,x^2 = 3\,x^6 + 3\,x^5 - x^4 + 5\,x^3 + 11\,x^2 - x$

[8] $4\,x^6 - 3\,x^3 - 4\,x + -2\,x^5 - 2\,x^4 + 3\,x^2 + 3\,x^3 = 4\,x^6 - 2\,x^5 - 2\,x^4 + 3\,x^2 - 4\,x$

[9] $x^4 + 4\,x^3 - 2\,x + -4\,x^5 - 3\,x^2 - 4\,x + -3\,x^6 - 4\,x^4 - 3\,x^3 = -3\,x^6 - 4\,x^5 - 3\,x^4 + x^3 - 3\,x^2 - 6\,x$

[10] $x^5 + 2\,x^2 + 2\,x + -x^2 + 2\,x^6 - 4\,x^3 = 2\,x^6 + x^5 - 4\,x^3 + x^2 + 2\,x$

Ejercicio 2: Realiza las siguientes sumas de polinomios:

[1] $0 + 0 + 0 = 0$

[2] $5\,x^2y^2 - 2\,xy^2 + 4\,x^2y^2 - 7\,xy^2 + -4\,x^2y^2 + 2\,x^2y - xy^2 = 5\,x^2y^2 + 2\,x^2y - 10\,xy^2$

[3] $-8\,x^2y^2 + 8\,xy^2 + (-8\,xy) + (-4\,x^2y^2 + 18\,x^2y) = -12\,x^2y^2 + 18\,x^2y + 8\,xy^2 - 8\,xy$

[4] $9\,x^2y^2 - 36\,x^2y - 3\,xy^2 + -9\,x^2y^2 + -6\,x^2y^2 + 9\,xy = -6\,x^2y^2 - 36\,x^2y - 3\,xy^2 + 9\,xy$

[5] $-4\,x^2y^2 - 12\,xy^2 + (-12\,xy^2 + 64\,xy) + (-16\,x^2y^2 + 64\,xy) = -20\,x^2y^2 - 24\,xy^2 + 128\,xy$

[6] $75\,x^2y^2 + 100\,x^2y - 100\,xy + -10\,x^2y^2 + 100\,xy^2 + 15\,x^2y + 15\,xy^2 - 10\,xy = 65\,x^2y^2 + 115\,x^2y + 115\,xy^2 - 110\,xy$

[7] $6\,xy^2 + 120\,xy + -144\,xy^2 - 48\,xy + -12\,x^2y^2 - 18\,x^2y + 108\,xy^2 = -12\,x^2y^2 - 18\,x^2y - 30\,xy^2 + 72\,xy$

[8] $21\,x^2y^2 + 7\,x^2y + 49\,xy^2 + -196\,x^2y^2 - 147\,x^2y + 7\,xy^2 + (-7\,x^2y^2 + 147\,xy) = -182\,x^2y^2 - 140\,x^2y + 56\,xy^2 + 147\,xy$

[9] $32\,x^2y + 64\,xy^2 - 256\,xy + 192\,x^2y - 24\,xy^2 - 24\,xy + -32\,x^2y + 256\,xy^2 + 256\,xy = 192\,x^2y + 296\,xy^2 - 24\,xy$

[10] $54\,x^2y^2 + 18\,xy^2 + -27\,x^2y - 153\,xy^2 + (-36\,x^2y^2 + 18\,x^2y + 9\,xy) = 18\,x^2y^2 - 9\,x^2y - 135\,xy^2 + 9\,xy$

Ejerciio 3 Realiza las siguientes sumas y restas de polinomios:

[1] $0 - (0) + (0) = 0$

[2] $7\,xy^2 + x^2y + 7\,xy^2 - (-x^2y - 3\,xy^2 + 4\,xy) = 2\,x^2y + 17\,xy^2 - 4\,xy$

[3] $12\,x^2y^2 - 4\,xy + 12\,x^2y - 4\,xy^2 + 4\,xy - (4\,x^2y^2 + 4\,xy^2 - 6\,xy) = 8\,x^2y^2 + 12\,x^2y - 8\,xy^2 + 6\,xy$

[4] $30\,x^2y - 9\,xy^2 - (36\,x^2y^2 + 33\,x^2y) + (-9\,x^2y^2 + 27\,x^2y + 9\,xy) = -45\,x^2y^2 + 24\,x^2y - 9\,xy^2 + 9\,xy$

[5] $-44\,x^2y^2 + 48\,x^2y - 8\,xy^2 - (20\,x^2y^2 + 12\,x^2y) = -64\,x^2y^2 + 36\,x^2y - 8\,xy^2$

[6] $50\,x^2y + 10\,xy^2 + 50\,xy + 100\,x^2y^2 + 80\,xy - (20\,x^2y^2 + 25\,x^2y + 5\,xy) = 80\,x^2y^2 + 25\,x^2y + 10\,xy^2 + 125\,xy$

[7] $24\,x^2y + 12\,xy^2 - 144\,xy - (-72\,x^2y^2 + 36\,x^2y) + (114\,x^2y^2 + 18\,xy) = 186\,x^2y^2 - 12\,x^2y + 12\,xy^2 - 126\,xy$

[8] $7\,x^2y + 98\,xy^2 - 196\,xy + -175\,xy - (-126\,x^2y - 7\,xy) = 133\,x^2y + 98\,xy^2 - 364\,xy$

[9] $192\,xy^2 + 48\,xy + -192\,x^2y^2 - 32\,x^2y - 16\,xy - (-224\,x^2y^2 + 32\,xy^2) = 32\,x^2y^2 - 32\,x^2y + 160\,xy^2 + 32\,xy$

[10] $216\,xy^2 + 243\,xy - (81\,x^2y^2 + 162\,x^2y + 9\,xy) + (18\,x^2y^2 + 18\,x^2y - 243\,xy) = -63\,x^2y^2 - 144\,x^2y + 216\,xy^2 - 9\,xy$

Ejercicio 3: Realiza las siguientes multiplicaciones de monomios:

[1] $(0) \cdot (0) = 0$

[2] $(2\,b^2x^3y^3z) \cdot (3\,bx^2y^3z) = 6\,b^3x^5y^6z^2$

[3] $(-8\,b^2x^2yz^3) \cdot (4\,bx^2y^2z^2) = -32\,b^3x^4y^3z^5$

[4] $(-12\,b^3x^3y^3z) \cdot (-27\,b^3x^3yz^2) = 324\,b^6x^6y^4z^3$

[5] $(128\,b^2x^2yz^3) \cdot (-192\,b^2x^3y^3z^2) = -24576\,b^4x^5y^4z^5$

[6] $(-100\,b^2x^3y^3z^2) \cdot (250\,b^2x^3y^3z^2) = -25000\,b^4x^6y^6z^4$

[7] $(648\,bx^3y^2z^2) \cdot (18\,b^3x^2y^2z) = 11664\,b^4x^5y^4z^3$

[8] $(98\,bx^2y^2z^2) \cdot (98\,bx^2yz) = 9604\,b^2x^4y^3z^3$

[9] $(-2048\,bxyz^3) \cdot (-256\,b^2xyz) = 524288\,b^3x^2y^2z^4$

[10] $(9\,b^2x^3yz) \cdot (-27\,bx^3yz^2) = -243\,b^3x^6y^2z^3$

Ejercicio 4: Realiza las siguientes multiplicaciones de polinomios:

[1] $(4\,x) \cdot (3\,x^2 + 2\,x) = 12\,x^3 + 8\,x^2$

[2] $(-x^2) \cdot (2\,x^2 - 7\,x) = -2\,x^4 + 7\,x^3$

[3] $(-3\,x) \cdot (6\,x) = -18\,x^2$

[4] $(4\,x^2) \cdot (-3\,x^2 + 4\,x) = -12\,x^4 + 16\,x^3$

[5] $(4\,x^2) \cdot (2\,x^2 + 6\,x) = 8\,x^4 + 24\,x^3$

[6] $(-x^2) \cdot (-5\,x^2 - 3\,x) = 5\,x^4 + 3\,x^3$

[7] $(-3\,x) \cdot (-5\,x^2 + 2\,x) = 15\,x^3 - 6\,x^2$

[8] $(3\,x^2) \cdot (-8\,x^2 + 2\,x) = -24\,x^4 + 6\,x^3$

[9] $(-3\,x^2) \cdot (4\,x^2) = -12\,x^4$

[10] $(x) \cdot (x^2) = x^3$

Ejercicio 5: Realiza las siguientes multiplicaciones de polinomios:

[1] $(x^2 - x) \cdot (-x^2 + 2\,x) = -x^4 + 3\,x^3 - 2\,x^2$

[2] $(4\,x^2 - 4\,x) \cdot (3\,x^2 + x) = 12\,x^4 - 8\,x^3 - 4\,x^2$

[3] $(4\,x^2 - x) \cdot (4\,x^2 - x) = 16\,x^4 - 8\,x^3 + x^2$

[4] $(3\,x^2 - 3\,x) \cdot (-x) = -3\,x^3 + 3\,x^2$

[5] $(-4\,x) \cdot (-9\,x^2) = 36\,x^3$

[6] $(-x^2 - 3\,x) \cdot (-2\,x^2 - x) = 2\,x^4 + 7\,x^3 + 3\,x^2$

[7] $(x^2 + 4\,x) \cdot (3\,x) = 3\,x^3 + 12\,x^2$

[8] $(0) \cdot (4\,x^2 - x) = 0$

[9] $(-3\,x^2 + 4\,x) \cdot (x^2 - 5\,x) = -3\,x^4 + 19\,x^3 - 20\,x^2$

[10] $(x^2 - x) \cdot (2\,x^2) = 2\,x^4 - 2\,x^3$

[11] $(2\,x^2 - 2\,x) \cdot (5\,x^2 + 3\,x) = 10\,x^4 - 4\,x^3 - 6\,x^2$

[12] $(-3\,x^2 + x) \cdot (x^2 - 3\,x) = -3\,x^4 + 10\,x^3 - 3\,x^2$

[13] $(0) \cdot (-4\,x^2 + x) = 0$

[14] $(-4\,x^2 - 4\,x) \cdot (3\,x^2 - 2\,x) = -12\,x^4 - 4\,x^3 + 8\,x^2$

[15] $(-4\,x^2 + 2\,x) \cdot (-3\,x) = 12\,x^3 - 6\,x^2$

Ejercicio 6: Realiza las siguientes multiplicaciones de polinomios:

[1] $(-x^3 - 4\,x^2 - 3\,x) \cdot (x^3 - x^2) = -x^6 - 3\,x^5 + x^4 + 3\,x^3$

[2] $(-4\,x^2 - x) \cdot (2\,x^3 + 4\,x^2 - 2\,x) = -8\,x^5 - 18\,x^4 + 4\,x^3 + 2\,x^2$

[3] $(-3\,x^3 - 4\,x) \cdot (-2\,x^3 - 3\,x^2 + x) = 6\,x^6 + 9\,x^5 + 5\,x^4 + 12\,x^3 - 4\,x^2$

[4] $(-2\,x^2 + 3\,x) \cdot (-2\,x^3 + 4\,x) = 4\,x^5 - 6\,x^4 - 8\,x^3 + 12\,x^2$

[5] $(-3\,x^3) \cdot (-2\,x^3 - 3\,x^2 - 6\,x) = 6\,x^6 + 9\,x^5 + 18\,x^4$

[6] $(3\,x^3 + 2\,x) \cdot (-2\,x^3) = -6\,x^6 - 4\,x^4$

[7] $(3\,x^3 + 3\,x^2) \cdot (-6\,x^3 + x) = -18\,x^6 - 18\,x^5 + 3\,x^4 + 3\,x^3$

[8] $(5\,x) \cdot (-4\,x^2 + 2\,x) = -20\,x^3 + 10\,x^2$

[9] $(-2\,x^3) \cdot (-x^3 - 3\,x^2 - 4\,x) = 2\,x^6 + 6\,x^5 + 8\,x^4$

[10] $(x^3 + 4\,x^2) \cdot (-6\,x^3 - 3\,x) = -6\,x^6 - 24\,x^5 - 3\,x^4 - 12\,x^3$

[11] $(-4\,x^2 - x) \cdot (x^2 - 3\,x) = -4\,x^4 + 11\,x^3 + 3\,x^2$

[12] $(-x^3 + x) \cdot (-3\,x^2 + x) = 3\,x^5 - x^4 - 3\,x^3 + x^2$

[13] $(6\,x) \cdot (-2\,x^3 - x^2 + x) = -12\,x^4 - 6\,x^3 + 6\,x^2$

[14] $(-2\,x^3 + 3\,x^2) \cdot (-3\,x^3 - x) = 6\,x^6 - 9\,x^5 + 2\,x^4 - 3\,x^3$

[15] $(-x^2 + x) \cdot (-4\,x^3 + 4\,x) = 4\,x^5 - 4\,x^4 - 4\,x^3 + 4\,x^2$

[16] $(-x) \cdot (3\,x^3 + 2\,x^2 + 4\,x) = -3\,x^4 - 2\,x^3 - 4\,x^2$

[17] $(-x^3 - 3\,x) \cdot (-3\,x^3 + 3\,x^2 - 7\,x) = 3\,x^6 - 3\,x^5 + 16\,x^4 - 9\,x^3 + 21\,x^2$

[18] $(-x) \cdot (-x^3 + 3\,x^2) = x^4 - 3\,x^3$

[19] $(-6\,x^3 - 3\,x^2) \cdot (3\,x^2) = -18\,x^5 - 9\,x^4$

[20] $(-3\,x^3 + 2\,x) \cdot (5\,x^2 - 4\,x) = -15\,x^5 + 12\,x^4 + 10\,x^3 - 8\,x^2$

Ejercicio 7: Realiza las siguientes multiplicaciones de polinomios:

[1] $(x^2y^2 + xy^2) \cdot (-x^2y^2 - x^2y + 3\,xy) = -x^4y^4 - x^4y^3 - x^3y^4 + 2\,x^3y^3 + 3\,x^2y^3$

[2] $(2\,x^2y + 2\,xy) \cdot (-2\,x^2y + 3\,xy^2 + 4\,xy) = -4\,x^4y^2 + 6\,x^3y^3 + 4\,x^3y^2 + 6\,x^2y^3 + 8\,x^2y^2$

[3] $(5\,xy) \cdot (-3\,x^2y^2 + 3\,xy) = -15\,x^3y^3 + 15\,x^2y^2$

[4] $(-5\,x^2y^2) \cdot (-6\,x^2y + 3\,xy^2) = 30\,x^4y^3 - 15\,x^3y^4$

[5] $(-5\,x^2y^2) \cdot (6\,xy^2) = -30\,x^3y^4$

[6] $(4\,x^2y^2 + xy^2) \cdot (-3\,x^2y^2 + 8\,xy^2) = -12\,x^4y^4 + 29\,x^3y^4 + 8\,x^2y^4$

[7] $(-x^2y^2 - 3\,x^2y) \cdot (-2\,x^2y + 3\,xy^2) = 2\,x^4y^3 - 3\,x^3y^4 + 6\,x^4y^2 - 9\,x^3y^3$