1. Evaluación 1ºD - Funciones

Ejercicio 1: Realiza las siguientes sumas de polinomios:

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

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

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

[4] $6\,x^6 + 2\,x^4 + -2\,x^4 - 4\,x^3 - 4\,x + x^6 - 4\,x^3 + 3\,x^2 = 7\,x^6 - 8\,x^3 + 3\,x^2 - 4\,x$

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

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

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

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

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

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

Ejercicio 2: Realiza las siguientes sumas de polinomios:

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

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

[3] $6\,x^2y^2 + 2\,xy^2 - 12\,xy + 8\,x^2y - 8\,xy^2 - 8\,xy + 4\,x^2y^2 + 8\,xy^2 + 8\,xy = 10\,x^2y^2 + 8\,x^2y + 2\,xy^2 - 12\,xy$

[4] $6\,x^2y + 9\,xy^2 + 9\,xy + -9\,x^2y - 3\,xy^2 - 9\,xy + -3\,x^2y^2 + 3\,x^2y - 18\,xy^2 = -3\,x^2y^2 - 12\,xy^2$

[5] $48\,x^2y^2 - 32\,x^2y - 4\,xy^2 + -16\,x^2y^2 - 16\,xy^2 - 16\,xy + 12\,x^2y^2 - 112\,x^2y = 44\,x^2y^2 - 144\,x^2y - 20\,xy^2 - 16\,xy$

[6] $-30\,x^2y^2 + (-5\,x^2y^2 + 65\,xy) + (-10\,x^2y - 20\,xy^2 - 15\,xy) = -35\,x^2y^2 - 10\,x^2y - 20\,xy^2 + 50\,xy$

[7] $24\,x^2y + 36\,xy + 180\,x^2y^2 + 18\,x^2y + 18\,x^2y^2 - 102\,xy = 198\,x^2y^2 + 42\,x^2y - 66\,xy$

[8] $21\,x^2y^2 - 217\,xy^2 + 147\,x^2y^2 - 154\,x^2y + 21\,x^2y^2 + 133\,x^2y = 189\,x^2y^2 - 21\,x^2y - 217\,xy^2$

[9] $256\,x^2y - 32\,xy^2 + 24\,xy + -56\,xy^2 - 192\,xy + 24\,x^2y^2 - 128\,x^2y + 8\,xy = 24\,x^2y^2 + 128\,x^2y - 88\,xy^2 - 160\,xy$

[10] $36\,x^2y^2 + 189\,x^2y + 36\,x^2y^2 + 36\,xy^2 - 36\,xy + -18\,x^2y + 171\,xy = 72\,x^2y^2 + 171\,x^2y + 36\,xy^2 + 135\,xy$

Ejerciio 3 Realiza las siguientes sumas y restas de polinomios:

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

[2] $3\,xy^2 - 3\,xy + -5\,xy - (7\,x^2y^2 + 3\,xy^2) = -7\,x^2y^2 - 8\,xy$

[3] $4\,x^2y - 12\,xy + -12\,x^2y^2 + 8\,xy^2 + 8\,xy - (6\,x^2y^2 + 8\,x^2y) = -18\,x^2y^2 - 4\,x^2y + 8\,xy^2 - 4\,xy$

[4] $-9\,xy^2 - 15\,xy - (-9\,x^2y^2 - 39\,xy^2) + (3\,x^2y^2 + 12\,xy^2 - 18\,xy) = 12\,x^2y^2 + 42\,xy^2 - 33\,xy$

[5] $-32\,x^2y^2 - 12\,x^2y + 12\,x^2y^2 - (4\,x^2y^2 + 12\,x^2y + 12\,xy) = -24\,x^2y^2 - 24\,x^2y - 12\,xy$

[6] $-25\,x^2y^2 + 65\,x^2y - 20\,xy - (70\,x^2y^2 - 10\,xy) = -95\,x^2y^2 + 65\,x^2y - 10\,xy$

[7] $156\,x^2y - 18\,xy - (30\,x^2y^2 + 18\,xy) + (6\,x^2y^2 - 18\,x^2y - 144\,xy) = -24\,x^2y^2 + 138\,x^2y - 180\,xy$

[8] $-28\,x^2y^2 - 147\,x^2y + 196\,xy^2 + -98\,x^2y^2 + 196\,xy^2 - 14\,xy - (-147\,x^2y - 203\,xy^2) = -126\,x^2y^2 + 595\,xy^2 - 14\,xy$

[9] $128\,x^2y^2 + 32\,xy + 56\,x^2y + 256\,xy^2 - (-256\,x^2y^2 + 32\,xy^2 + 8\,xy) = 384\,x^2y^2 + 56\,x^2y + 224\,xy^2 + 24\,xy$

[10] $-63\,xy^2 - 162\,xy - (-27\,x^2y - 27\,xy^2 - 324\,xy) + (27\,x^2y^2 + 324\,x^2y + 81\,xy) = 27\,x^2y^2 + 351\,x^2y - 36\,xy^2 + 243\,xy$

Ejercicio 3: Realiza las siguientes multiplicaciones de monomios:

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

[2] $(-4\,b^3x^3yz^2) \cdot (-3\,b^2x^2yz^3) = 12\,b^5x^5y^2z^5$

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

[4] $(6\,b^3x^2y^3z^3) \cdot (-36\,bxy^2z) = -216\,b^4x^3y^5z^4$

[5] $(64\,bx^2yz^2) \cdot (8\,b^2x^3y^2z^3) = 512\,b^3x^5y^3z^5$

[6] $(-250\,b^3x^2y^3z^2) \cdot (-75\,b^3x^3y^2z) = 18750\,b^6x^5y^5z^3$

[7] $(36\,bx^3y^3z^2) \cdot (72\,b^2x^2yz^2) = 2592\,b^3x^5y^4z^4$

[8] $(49\,b^2xy^2z^3) \cdot (-147\,bx^3y^2z^2) = -7203\,b^3x^4y^4z^5$

[9] $(256\,b^3x^2y^3z) \cdot (512\,bxy^3z^2) = 131072\,b^4x^3y^6z^3$

[10] $(-729\,bx^3yz^3) \cdot (36\,bxy^3z) = -26244\,b^2x^4y^4z^4$

Ejercicio 4: Realiza las siguientes multiplicaciones de polinomios:

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

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

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

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

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

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

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

[8] $(-4\,x) \cdot (3\,x^2 - 8\,x) = -12\,x^3 + 32\,x^2$

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

[10] $(4\,x) \cdot (2\,x^2 - 6\,x) = 8\,x^3 - 24\,x^2$

Ejercicio 5: Realiza las siguientes multiplicaciones de polinomios:

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

[2] $(-3\,x) \cdot (7\,x) = -21\,x^2$

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

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

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

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

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

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

[9] $(3\,x^2 - x) \cdot (x^2 + 4\,x) = 3\,x^4 + 11\,x^3 - 4\,x^2$

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

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

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

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

[14] $(-4\,x^2 - x) \cdot (-2\,x^2 - 5\,x) = 8\,x^4 + 22\,x^3 + 5\,x^2$

[15] $(-2\,x^2) \cdot (4\,x) = -8\,x^3$

Ejercicio 6: Realiza las siguientes multiplicaciones de polinomios:

[1] $(2\,x^3) \cdot (4\,x^3 + 2\,x^2 + 4\,x) = 8\,x^6 + 4\,x^5 + 8\,x^4$

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

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

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

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

[6] $(-2\,x^2 + 4\,x) \cdot (-6\,x^3 + 3\,x^2 - x) = 12\,x^5 - 30\,x^4 + 14\,x^3 - 4\,x^2$

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

[8] $(4\,x^2 - 4\,x) \cdot (5\,x^3 + 2\,x^2 - 4\,x) = 20\,x^5 - 12\,x^4 - 24\,x^3 + 16\,x^2$

[9] $(4\,x^3 - 2\,x^2) \cdot (3\,x^3 + x^2 + 6\,x) = 12\,x^6 - 2\,x^5 + 22\,x^4 - 12\,x^3$

[10] $(-3\,x^3 - 3\,x^2 - x) \cdot (3\,x^3 + 6\,x) = -9\,x^6 - 9\,x^5 - 21\,x^4 - 18\,x^3 - 6\,x^2$

[11] $(-2\,x^3 - 2\,x) \cdot (7\,x^2 + 2\,x) = -14\,x^5 - 4\,x^4 - 14\,x^3 - 4\,x^2$

[12] $(x^3 + 4\,x) \cdot (-8\,x^3 + 3\,x^2 + 4\,x) = -8\,x^6 + 3\,x^5 - 28\,x^4 + 12\,x^3 + 16\,x^2$

[13] $(-3\,x^3 - x^2) \cdot (-x^2 - x) = 3\,x^5 + 4\,x^4 + x^3$

[14] $(-4\,x) \cdot (-4\,x^3 - x^2) = 16\,x^4 + 4\,x^3$

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

[16] $(4\,x^2 + 2\,x) \cdot (8\,x) = 32\,x^3 + 16\,x^2$

[17] $(7\,x^3) \cdot (5\,x^3 + 2\,x^2 + 2\,x) = 35\,x^6 + 14\,x^5 + 14\,x^4$

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

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

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

Ejercicio 7: Realiza las siguientes multiplicaciones de polinomios:

[1] $(-3\,x^2y^2 - 2\,xy) \cdot (x^2y + 3\,xy^2) = -3\,x^4y^3 - 9\,x^3y^4 - 2\,x^3y^2 - 6\,x^2y^3$

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

[3] $(4\,x^2y^2 + 4\,xy) \cdot (3\,x^2y^2 - 3\,xy^2 + 2\,xy) = 12\,x^4y^4 - 12\,x^3y^4 + 20\,x^3y^3 - 12\,x^2y^3 + 8\,x^2y^2$

[4] $(-3\,xy^2 - 2\,xy) \cdot (-9\,xy) = 27\,x^2y^3 + 18\,x^2y^2$

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

[6] $(4\,x^2y^2 + 2\,xy) \cdot (x^2y^2 + 3\,x^2y + 3\,xy) = 4\,x^4y^4 + 12\,x^4y^3 + 14\,x^3y^3 + 6\,x^3y^2 + 6\,x^2y^2$

[7] $(4\,xy^2 - xy) \cdot (5\,x^2y^2 + x^2y) = 20\,x^3y^4 - x^3y^3 - x^3y^2$