# 1. Evaluación 1ºD - Funciones

Ejercicio 1:  Realiza las siguientes sumas de polinomios:

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

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

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

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

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

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

[7]  $2\,x^3 + x^2 + x + 3\,x^6 + 6\,x + -2\,x^2 + 2\,x = 3\,x^6 + 2\,x^3 - x^2 + 9\,x$

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

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

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

Ejercicio 2:  Realiza las siguientes sumas de polinomios:

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

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

[3]  $16\,x^2y - 8\,xy^2 + 6\,x^2y^2 - 8\,xy^2 + 4\,xy + -6\,x^2y - 12\,xy^2 + 12\,xy = 6\,x^2y^2 + 10\,x^2y - 28\,xy^2 + 16\,xy$

[4]  $3\,x^2y^2 + -36\,x^2y^2 - 36\,xy^2 + 27\,xy + 3\,x^2y^2 + 9\,xy^2 = -30\,x^2y^2 - 27\,xy^2 + 27\,xy$

[5]  $4\,x^2y^2 - 16\,xy^2 - 16\,xy + 4\,x^2y + 64\,xy^2 - 16\,xy + -12\,x^2y^2 + 16\,x^2y + 48\,xy^2 = -8\,x^2y^2 + 20\,x^2y + 96\,xy^2 - 32\,xy$

[6]  $20\,x^2y + 10\,xy^2 + 10\,xy + -100\,x^2y^2 + 25\,x^2y + 10\,xy^2 + 5\,x^2y^2 + 15\,x^2y - 100\,xy^2 = -95\,x^2y^2 + 60\,x^2y - 80\,xy^2 + 10\,xy$

[7]  $72\,x^2y^2 - 6\,xy^2 - 24\,xy + -36\,x^2y^2 - 138\,xy^2 + -114\,x^2y^2 - 18\,xy^2 = -78\,x^2y^2 - 162\,xy^2 - 24\,xy$

[8]  $147\,x^2y^2 + 14\,x^2y - 98\,xy^2 + 49\,x^2y + 14\,xy^2 + 98\,xy + -147\,x^2y + 28\,xy^2 - 196\,xy = 147\,x^2y^2 - 84\,x^2y - 56\,xy^2 - 98\,xy$

[9]  $-128\,x^2y^2 - 64\,xy^2 - 64\,xy + (-256\,x^2y^2 - 256\,x^2y + 64\,xy^2) + (-16\,x^2y^2 - 16\,xy^2) = -400\,x^2y^2 - 256\,x^2y - 16\,xy^2 - 64\,xy$

[10]  $36\,x^2y^2 - 9\,x^2y + 81\,xy + 324\,xy^2 + 18\,xy + -324\,x^2y + 162\,xy^2 - 81\,xy = 36\,x^2y^2 - 333\,x^2y + 486\,xy^2 + 18\,xy$

Ejerciio 3  Realiza las siguientes sumas y restas de polinomios:

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

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

[3]  $-2\,x^2y^2 + 4\,x^2y + 4\,x^2y + 6\,xy - (-30\,x^2y) = -2\,x^2y^2 + 38\,x^2y + 6\,xy$

[4]  $36\,x^2y^2 - 36\,xy^2 - 6\,xy - (6\,x^2y - 9\,xy^2) + (12\,x^2y^2 - 27\,x^2y - 12\,xy) = 48\,x^2y^2 - 33\,x^2y - 27\,xy^2 - 18\,xy$

[5]  $-68\,x^2y - 4\,xy + 4\,x^2y - 64\,xy^2 - 48\,xy - (-48\,x^2y + 64\,xy) = -16\,x^2y - 64\,xy^2 - 116\,xy$

[6]  $-105\,x^2y^2 - 20\,xy^2 + -20\,x^2y^2 + 100\,xy^2 - 25\,xy - (-30\,xy) = -125\,x^2y^2 + 80\,xy^2 + 5\,xy$

[7]   $-108\,x^2y^2+18\,xy^2+108\,xy-(36\,x^2y^2-6\,xy^2+12\,xy)+(-12\,x^2y^2-180\,xy) =$
$-156\,x^2y^2 + 24\,xy^2 - 84\,xy$

[8]   $-7\,x^2y^2 + 196\,x^2y + 28\,xy + 7\,x^2y + 147\,xy^2 + 21\,xy - (-112\,x^2y^2 + 14\,xy) =$
$105\,x^2y^2 + 203\,x^2y + 147\,xy^2 + 35\,xy$

[9]   $-8\,x^2y^2 - 56\,x^2y + -224\,x^2y + 24\,xy - (32\,x^2y^2 - 256\,x^2y + 192\,xy) =$
$-40\,x^2y^2 - 24\,x^2y - 168\,xy$

[10]   $27\,x^2y + 117\,xy - (-243\,x^2y^2 - 81\,xy^2) + (36\,x^2y - 18\,xy^2) = 243\,x^2y^2 +$
$63\,x^2y + 63\,xy^2 + 117\,xy$

**Ejercicio 3:** Realiza las siguientes multiplicaciones de monomios:

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

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

[3]   $(24\,b^2xy^2z) \cdot (-16\,bxy^2z) = -384\,b^3x^2y^4z^2$

[4]   $(12\,bx^3yz) \cdot (-9\,bxy^2z) = -108\,b^2x^4y^3z^2$

[5]   $(48\,b^2x^2y^3z) \cdot (-64\,b^3x^2yz^2) = -3072\,b^5x^4y^4z^3$

[6]   $(125\,b^2x^2yz^3) \cdot (-5\,b^3x^3y^2z^2) = -625\,b^5x^5y^3z^5$

[7]   $(648\,b^2x^3y^2z^2) \cdot (-432\,b^2x^2yz^3) = -279936\,b^4x^5y^3z^5$

[8]   $(147\,bxy^3z) \cdot (-686\,bx^2yz^2) = -100842\,b^2x^3y^4z^3$

[9]   $(192\,b^3x^2yz^3) \cdot (256\,bxy^3z^3) = 49152\,b^4x^3y^4z^6$

[10]   $(9\,b^2x^2y^3z^2) \cdot (9\,b^3x^2y^3z) = 81\,b^5x^4y^6z^3$

**Ejercicio 4:** Realiza las siguientes multiplicaciones de polinomios:

[1]   $(3\,x^2) \cdot (x^2 + 7\,x) = 3\,x^4 + 21\,x^3$

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

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

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

[5]   $(3\,x^2) \cdot (7\,x) = 21\,x^3$

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

[7]   $(2\,x) \cdot (-x^2 + 4\,x) = -2\,x^3 + 8\,x^2$

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

[9]   $(-4\,x) \cdot (2\,x^2 + 8\,x) = -8\,x^3 - 32\,x^2$

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

**Ejercicio 5:** Realiza las siguientes multiplicaciones de polinomios:

[1]   $(5\,x^2) \cdot (-4\,x^2) = -20\,x^4$

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

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

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

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

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

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

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

[9]   $(-x^2 - 4\,x) \cdot (-2\,x^2 - 6\,x) = 2\,x^4 + 14\,x^3 + 24\,x^2$

[10]   $(x^2 - 4\,x) \cdot (-2\,x^2 + 5\,x) = -2\,x^4 + 13\,x^3 - 20\,x^2$

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

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

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

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

[15]   $(5\,x) \cdot (2\,x^2 - 3\,x) = 10\,x^3 - 15\,x^2$

**Ejercicio 6:** Realiza las siguientes multiplicaciones de polinomios:

[1]   $(-2\,x^2 + 3\,x) \cdot (-x^3 + 2\,x^2 + 3\,x) = 2\,x^5 - 7\,x^4 + 9\,x^2$

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

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

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

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

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

[7]   $(5\,x^3 - 2\,x) \cdot (3\,x^2 + 4\,x) = 15\,x^5 + 20\,x^4 - 6\,x^3 - 8\,x^2$

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

[9]   $(-6\,x^2) \cdot (-7\,x^3 - x^2) = 42\,x^5 + 6\,x^4$

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

[11]   $(-4\,x^2 - x) \cdot (x^3 + 5\,x^2 + x) = -4\,x^5 - 21\,x^4 - 9\,x^3 - x^2$

[12]   $(-2\,x^3 - 3\,x^2) \cdot (8\,x^3 - 3\,x^2 + 4\,x) = -16\,x^6 - 18\,x^5 + x^4 - 12\,x^3$

[13]   $(3\,x^3 + x^2) \cdot (7\,x^2 + x) = 21\,x^5 + 10\,x^4 + x^3$

[14]   $(-2\,x^3 - 2\,x) \cdot (5\,x^2) = -10\,x^5 - 10\,x^3$

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

[16]   $(-8\,x^3 - 3\,x^2) \cdot (-5\,x^3 + 2\,x^2) = 40\,x^6 - x^5 - 6\,x^4$

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

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

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

[20]   $(-4\,x^3 - x) \cdot (3\,x^3 - 2\,x^2) = -12\,x^6 + 8\,x^5 - 3\,x^4 + 2\,x^3$

**Ejercicio 7:** Realiza las siguientes multiplicaciones de polinomios:

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

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

[3]   $(-2\,x^2y + 3\,xy) \cdot (-4\,x^2y + 6\,xy) = 8\,x^4y^2 - 24\,x^3y^2 + 18\,x^2y^2$

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

[5]   $(2\,x^2y - 4\,xy) \cdot (2\,x^2y + 7\,xy^2) = 4\,x^4y^2 + 14\,x^3y^3 - 8\,x^3y^2 - 28\,x^2y^3$

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

[7]   $(-3\,x^2y^2 + xy) \cdot (-x^2y^2 + 2\,x^2y - 4\,xy^2) = 3\,x^4y^4 - 6\,x^4y^3 + 12\,x^3y^4 - x^3y^3 + 2\,x^3y^2 - 4\,x^2y^3$