# 1. Evaluación 1°D - Funciones

**Ejercicio 1:** Realiza las siguientes sumas de polinomios:

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

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

[3]   $5x^6 + 3x^6 + 7x^3 + -3x^4 - x^3 + 4x^2 = 8x^6 - 3x^4 + 6x^3 + 4x^2$

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

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

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

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

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

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

[10]   $-6x^4 + 3x^2 + (-2x^5 + 2x^3 - 2x) + (-2x^6 - 2x^4 - 3x^3) = -2x^6 - 2x^5 - 8x^4 - x^3 + 3x^2 - 2x$

**Ejercicio 2:** Realiza las siguientes sumas de polinomios:

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

[2]   $-2x^2y^2 + x^2y - 4xy + (-2x^2y^2 - 4x^2y + 2xy^2) + (-2x^2y - 2xy) = -4x^2y^2 - 5x^2y + 2xy^2 - 6xy$

[3]   $24x^2y^2 - 4xy^2 + 12x^2y + 16xy^2 + -4xy^2 + 4xy = 24x^2y^2 + 12x^2y + 8xy^2 + 4xy$

[4]   $3x^2y^2 + 9xy^2 + -18x^2y^2 + 6x^2y + 3xy + -9x^2y^2 - 36xy^2 = -24x^2y^2 + 6x^2y - 27xy^2 + 3xy$

[5]   $16x^2y + 4xy^2 - 64xy + 4xy^2 - 8xy + -8x^2y^2 + 96xy^2 = -8x^2y^2 + 16x^2y + 104xy^2 - 72xy$

[6]   $10x^2y^2 + 25x^2y + -60x^2y - 100xy^2 + -80x^2y^2 + 5xy^2 = -70x^2y^2 - 35x^2y - 95xy^2$

[7]   $24x^2y^2 - 30xy + -6x^2y + 6xy^2 + (-120x^2y + 144xy^2) = 24x^2y^2 - 126x^2y + 150xy^2 - 30xy$

[8]   $49x^2y + 7xy^2 + 196xy + -147x^2y^2 + 98x^2y - 147xy^2 + -203xy = -147x^2y^2 + 147x^2y - 140xy^2 - 7xy$

[9]   $-512x^2y^2 + 8xy^2 + (-24x^2y - 192xy^2 - 32xy) + (-192x^2y^2 + 16x^2y - 24xy) = -704x^2y^2 - 8x^2y - 184xy^2 - 56xy$

[10]   $9x^2y^2 + 324xy^2 - 18xy + -648x^2y^2 - 36x^2y + 45x^2y^2 - 324x^2y = -594x^2y^2 - 360x^2y + 324xy^2 - 18xy$

**Ejerciio 3** Realiza las siguientes sumas y restas de polinomios:

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

[2]   $7x^2y^2 + x^2y + 2x^2y + 4xy^2 - 4xy - (-2x^2y^2 - x^2y + xy) = 9x^2y^2 + 4x^2y + 4xy^2 - 5xy$

[3]   $8x^2y^2 - 16x^2y - 16xy + -2x^2y^2 + 8xy - (-6x^2y^2 - 6xy^2 - 4xy) = 12x^2y^2 - 16x^2y + 6xy^2 - 4xy$

[4]   $-9x^2y^2 + 18x^2y + 18xy - (-6x^2y^2 - 6xy) + (36xy^2 + 12xy) = -3x^2y^2 + 18x^2y + 36xy^2 + 36xy$

[5] $-8\,x^2y - 64\,xy^2 - 12\,xy + 16\,x^2y^2 + 32\,xy^2 - (8\,x^2y + 28\,xy) = 16\,x^2y^2 - 16\,x^2y - 32\,xy^2 - 40\,xy$

[6] $-10\,x^2y^2 - 85\,x^2y + 30\,x^2y + 25\,xy^2 - (100\,x^2y^2 + 75\,x^2y - 15\,xy^2) = -110\,x^2y^2 - 130\,x^2y + 40\,xy^2$

[7] $-36\,x^2y^2 - (-6\,x^2y^2 + 24\,x^2y + 72\,xy) + (-48\,x^2y^2 - 72\,xy) = -78\,x^2y^2 - 24\,x^2y - 144\,xy$

[8] $-140\,x^2y - 21\,xy + 147\,x^2y^2 - (14\,x^2y^2 - 98\,x^2y - 14\,xy^2) = 133\,x^2y^2 - 42\,x^2y + 14\,xy^2 - 21\,xy$

[9] $96\,x^2y^2 - 192\,xy + 16\,xy^2 - (8\,x^2y^2 + 64\,x^2y - 256\,xy^2) = 88\,x^2y^2 - 64\,x^2y + 272\,xy^2 - 192\,xy$

[10] $27\,x^2y^2 - 162\,x^2y - 36\,xy - (-9\,x^2y^2 - 72\,xy^2) + (162\,x^2y + 81\,xy^2 + 81\,xy) = 36\,x^2y^2 + 153\,xy^2 + 45\,xy$

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

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

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

[3] $(-6\,b^2xy^2z) \cdot (-12\,bx^2y^3z) = 72\,b^3x^3y^5z^2$

[4] $(81\,b^3x^2y^3z^2) \cdot (12\,b^2xy^3z^2) = 972\,b^5x^3y^6z^4$

[5] $(128\,b^2xy^3z^2) \cdot (128\,bx^3y^3z) = 16384\,b^3x^4y^6z^3$

[6] $(375\,b^3xy^3z^3) \cdot (-25\,b^2x^2yz^3) = -9375\,b^5x^3y^4z^6$

[7] $(-108\,b^3x^2y^3z) \cdot (648\,bx^3y^2z) = -69984\,b^4x^5y^5z^2$

[8] $(-196\,bx^2yz) \cdot (98\,b^2xyz) = -19208\,b^3x^3y^2z^2$

[9] $(-64\,bx^3y^3z^2) \cdot (-1536\,bx^2y^2z^2) = 98304\,b^2x^5y^5z^4$

[10] $(27\,b^2x^2y^2z^2) \cdot (27\,b^3x^3y^2z) = 729\,b^5x^5y^4z^3$

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

[1] $(-2\,x^2) \cdot (5\,x^2 + x) = -10\,x^4 - 2\,x^3$

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

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

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

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

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

[7] $(4\,x^2) \cdot (-4\,x^2 + 9\,x) = -16\,x^4 + 36\,x^3$

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

[9] $(-4\,x^2) \cdot (-4\,x) = 16\,x^3$

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

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

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

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

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

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

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

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

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

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

[9]   $(-6\,x^2) \cdot (2\,x^2 - 3\,x) = -12\,x^4 + 18\,x^3$

[10]   $(0) \cdot (-8\,x) = 0$

[11]   $(4\,x^2 - 3\,x) \cdot (2\,x^2 - 5\,x) = 8\,x^4 - 26\,x^3 + 15\,x^2$

[12]   $(-4\,x^2 + 2\,x) \cdot (-5\,x^2 + 3\,x) = 20\,x^4 - 22\,x^3 + 6\,x^2$

[13]   $(5\,x^2) \cdot (-5\,x^2) = -25\,x^4$

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

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

Ejercicio 6:  Realiza las siguientes multiplicaciones de polinomios:

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

[2]   $(-5\,x) \cdot (-x^3 + 2\,x^2 - 5\,x) = 5\,x^4 - 10\,x^3 + 25\,x^2$

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

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

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

[6]   $(2\,x^3 + 4\,x) \cdot (-4\,x^3 - 3\,x) = -8\,x^6 - 22\,x^4 - 12\,x^2$

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

[8]   $(2\,x^2 - x) \cdot (x^2 - 5\,x) = 2\,x^4 - 11\,x^3 + 5\,x^2$

[9]   $(-x^3 - 2\,x) \cdot (-4\,x^3 + 4\,x^2 - 3\,x) = 4\,x^6 - 4\,x^5 + 11\,x^4 - 8\,x^3 + 6\,x^2$

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

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

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

[13]   $(2\,x^3 + 5\,x) \cdot (x^3) = 2\,x^6 + 5\,x^4$

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

[15]   $(-4\,x^2 + 4\,x) \cdot (2\,x^3 + 2\,x^2 + 4\,x) = -8\,x^5 - 8\,x^3 + 16\,x^2$

[16]   $(3\,x^3 + 2\,x^2) \cdot (-5\,x^2 - 2\,x) = -15\,x^5 - 16\,x^4 - 4\,x^3$

[17]   $(-4\,x^3 - 2\,x^2) \cdot (3\,x^3 - x^2 + 2\,x) = -12\,x^6 - 2\,x^5 - 6\,x^4 - 4\,x^3$

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

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

[20]   $(2\,x^2 + 4\,x) \cdot (8\,x^3 + x^2 - 3\,x) = 16\,x^5 + 34\,x^4 - 2\,x^3 - 12\,x^2$

Ejercicio 7:  Realiza las siguientes multiplicaciones de polinomios:

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

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

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

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

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

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

[7]   $(2\,x^2y^2+2\,xy^2)\cdot(-5\,x^2y) = -10\,x^4y^3-10\,x^3y^3$