

Operations with Polynomials

Simplify each expression.

$$1) (3a - 7a^2) - (8a^2 + 6a^3 + 4a)$$

$$3a - 7a^2 - 8a^2 - 6a^3 + 4a$$

$$-6a^3 - 15a^2 + 7a$$

$$3) (10p - 5p^3 - 11p^5) - (5p^5 + 5p^3 + 11)$$

$$10p - 5p^3 - 11p^5 - 5p^5 - 5p^3 - 11$$

$$-10p^5 - 10p^3 + 10p - 11$$

$$5) (-7 - p^4 + 13p^5) + (2p^4 + 13 + 3p^5)$$

$$16p^5 + p^4 + 6$$

$$7) (4x^3 + 11 + 5x^5) + (-5x^3 + 6 - x^5)$$

$$4x^5 - x^3 + 17$$

Find each product.

$$9) 5n^2(n - 3) = 5n^3 - 15n^2$$

$$11) 7(4n + 6) = 28n + 42$$

$$13) (7x + 5)(x - 5) = 7x^2 + 5x - 35x - 25$$

$$= 7x^2 - 30x - 25$$

$$15) (2m^2 + 7mn - 3n^2)(5m - 8n)$$

$$2 \quad 10m^3 + 35m^2n - 15mn^2 - 16m^2n - 56mn^2 + 24n^3$$

$$\Rightarrow 10m^3 + 19m^2n - 71mn^2 + 24n^3$$

$$2) (2b + 1) - (b^2 + 6 - 2b)$$

$$2b + 1 - b^2 - 6 + 2b$$

$$-b^2 + 4b - 5$$

$$4) (-7m - 7m^2 + 3m^5) - (13m + 4m^2 + 11m^5)$$

$$-7m - 7m^2 + 3m^5 - 13m - 4m^2 - 11m^5$$

$$-20m - 3m^2 + 14m^5$$

$$6) (1 + a^3 - 2a^2) + (2a^4 + 6 + 2a^2)$$

$$2a^4 + a^3 - 4a^2 + 7$$

$$8) (13 - 12x^2 + 14x) + (9x + 9x^4 + 9)$$

$$9x^4 - 12x^2 + 25x + 22$$

$$10) 3(3x - 8) = 9x - 24$$

$$12) 8a^3(6a + 6) = 48a^4 + 48a^3$$

$$14) (8n - 7)(8n + 5) = 64n^2 - 56n + 40n - 35$$

$$= 64n^2 - 16n - 35$$

$$16) (8x^2 + 4xy - 8y^2)(5x - 7y)$$

Problem

$$16) 40x^3 + 20x^2y - 40xy^2 - 56x^2y - 28xy^2 + 56y^3$$

$$40x^3 - 36x^2y - 68xy^2 + 56y^3$$