

Polynomial Operations

Date _____ Period _____

Simplify each expression.

$$1) (-8p^4 - 1 + 7p^3) + (-5 - p^4 - 6p^3)$$

$$\underline{-8p^4} + \underline{7p^3} - 1 - 5 - \underline{p^4} - \underline{6p^3}$$

$$-9p^4 + p^3 - 6$$

Quartic Trinomial

$$2) (5r^2 - 7r - 3r^4) - (3r - 5r^2 + 8r^4)$$

$$\underline{5r^2} - \underline{7r} - \underline{3r^4} - \underline{3r} + \underline{5r^2} - \underline{8r^4}$$

$$-11r^4 + 10r^2 - 10r$$

Quartic Trinomial

$$3) (3 + 8a^2 - 7a) - (a^2 + 8a + 3)$$

$$\underline{3} + \underline{8a^2} - \underline{7a} - \underline{a^2} - \underline{8a} - \underline{3}$$

$$7a^2 - 15a$$

Quadratic Binomial

$$4) (-5b - 6 - 6b^2) - (8b^2 + b - 2)$$

$$\underline{-5b} - \underline{6} - \underline{6b^2} - \underline{8b^2} - \underline{b} + \underline{2}$$

$$-4b^2 - 6b - 4$$

$$5) (7v^2 - 7 - 7v) + (8v^2 + 6v + 4v^5) - (7v^5 + 3v^2)$$

$$\underline{7v^2} - \underline{7} - \underline{7v} + \underline{8v^2} + \underline{6v} + \underline{4v^5} - \underline{7v^5} - \underline{3v^2}$$

$$-3v^5 + 12v^2 - v - 7$$

Quintic Polynomial with 4 terms

$$6) (3m + 3m^2 - 3m^3) - (6m^4 - 4m^5 + 7m) + (5 + 2m^2)$$

$$\underline{3m} + \underline{3m^2} - \underline{3m^3} - \underline{6m^4} + \underline{4m^5} - \underline{7m} + \underline{5} + \underline{2m^2}$$

$$4m^5 - 6m^4 - 3m^3 + 5m^2 - 4m + 5$$

Quintic Polynomial with 6 terms

Find each product.

$$7) (6x - 2)(4x - 8)$$

$$\underline{24x^2} - \underline{48x} - \underline{8x} + \underline{16}$$

$$24x^2 - 56x + 16$$

$$8) (8a + 3)(4a + 3)$$

$$\underline{32a^2} + \underline{24a} + \underline{12a} + \underline{9}$$

$$32a^2 + 36a + 9$$

$$9) (2k+7)(3k-1)$$

$$6k^2 - 2k + 21k - 7$$

$$6k^2 + 19k - 7$$

$$10) (2x-7)(x^2-4x+6)$$

$$2x^3 - 8x^2 + 12x - 7x^2 + 28x - 42$$

$$2x^3 - 15x^2 + 40x - 42$$

$$11) (4k-6)(7k^2+6k+6)$$

$$28k^3 + 24k^2 + 24k - 42k^2 - 36k - 36$$

$$28k^3 - 18k^2 - 12k - 36$$

$$12) (6a-2)(7a^2+6a-8)$$

$$42a^3 + 36a^2 - 48a + 14a^2 + 12a - 16$$

$$42a^3 + 50a^2 - 36a - 16$$

Factor each completely.

No GCF

$$13) 5a^2 - 42a + 16$$

$$5a^2 - 40a + 2a + 16$$

$$5a(a-8) - 2(a-8)$$

$$(a-8)(5a-2)$$

$$\begin{array}{r} 80 \\ 40 \end{array} \begin{array}{r} -2 \\ -1 \end{array}$$

$$\begin{array}{r} 16 \\ 8 \\ 4 \end{array} \begin{array}{r} 1 \\ 2 \\ 4 \end{array}$$

$$\begin{array}{r} 20 \\ 40 \end{array} \begin{array}{r} 1 \\ 2 \end{array}$$

No GCF

$$14) 7b^2 + 2b - 9$$

$$7b^2 - 7b + 9b - 9$$

$$7b(b-1) + 9(b-1)$$

$$(b-1)(7b+9)$$

$$\begin{array}{r} -63 \\ 9 \end{array} \begin{array}{r} -7 \\ -1 \end{array}$$

$$\begin{array}{r} 9 \\ 2 \end{array} \begin{array}{r} 7 \\ 9 \end{array}$$

No GCF

$$15) 7n^2 - 47n + 30$$

$$7n^2 - 5n - 42n + 30$$

$$n(7n-5) - 6(7n-5)$$

$$(7n-5)(n-6)$$

$$\begin{array}{r} 210 \\ 5 \end{array} \begin{array}{r} -2 \\ -1 \end{array}$$

$$\begin{array}{r} 7, 30 \\ 5, 42 \end{array}$$

No GCF

$$16) 7n^2 - 19n - 6$$

$$7n^2 + 2n - 21n - 6$$

$$n(7n+2) - 3(7n+2)$$

$$(7n+2)(n-3)$$

$$\begin{array}{r} -42 \\ 2 \end{array} \begin{array}{r} -2 \\ -1 \end{array}$$

$$\begin{array}{r} 1, 42 \\ 2, 21 \end{array}$$

$$17) 3a^2 - 36a + 81$$

$$gcf: 3$$

$$3(a^2 - 12a + 27)$$

$$3(a^2 - 9a + 27)$$

$$3(a(a-9) - 9(a-9))$$

$$3(a-9)(a-9)$$

$$\begin{array}{r} 27 \\ -3 \end{array} \begin{array}{r} -9 \\ -1 \end{array}$$

$$\begin{array}{r} 1, 27 \\ 3, 9 \end{array}$$

$$18) 4k^2 - 44k + 72$$

$$gcf: 4$$

$$4(k^2 - 11k + 18)$$

$$4(k^2 - 2k - 9k + 18)$$

$$k(k-2) - 9(k-2)$$

$$(k-2)(k-9)$$

$$\begin{array}{r} 18 \\ -2 \end{array} \begin{array}{r} -9 \\ -1 \end{array}$$

$$\begin{array}{r} 1, 18 \\ 2, 9 \end{array}$$