Esercizi di riepilogo

Esercizi proposti

■ Espressioni

Semplificare le seguenti **espressioni**.

559. $(x - 3y)(x + 3y)(x^2 + 9y^2) - 9(x^4 - 9y^4)$. $\qquad [-8x^4]$

560. $(a + b)(a - b) - a(a - 2b)$. $\qquad [2ab - b^2]$

561. $(p^2 + 1)(p + 1)(p - 1) - p^3(p - 1) + (1 - p)(p^2 + p + 1)$. $\qquad [0]$

562. $(2x - 3y)(2x + 3y) + (5x + y)(y - 5x) - (2x + y)(x - 8y)$. $\qquad [-23x^2 + 15xy]$

563. $(x - 1)(x + 3) - (x + 1)^2 - (x + 2)^2 + 2(x + 3)^2$. $\qquad [x^2 + 8x + 10]$

564. $y(y^3 + 3) - 3(y - 1) - (y^2 - 1)(y^2 + 1)$. $\qquad [4]$

565. $(5x + y) \cdot (5x - y) - (4x + 5y) \cdot (4x - 5y) - 28y^2$. $\qquad [9x^2 - 4y^2]$

566. $(x^2 + y^2) \cdot (x + y) \cdot (y - x) - (x^2 - y^2) \cdot (x^2 + y^2) + (x^3 + y^3) \cdot (2x - 3y)$. $\qquad [-3x^3y + 2xy^3 - y^4]$

567. $(x^3 + x^2 + x + 1) \cdot (1 - x); \qquad 4x^2 + (x^2 - 1)^2$. $\qquad [1 - x^4; \ x^4 + 2x^2 + 1]$

568. $x^3 - y^3 - 3xy(x - y); \qquad \left(\dfrac{x + y}{2}\right)^2 - \left(\dfrac{x - y}{2}\right)^2$. $\qquad [x^3 - 3x^2y + 3xy^2 - y^3; \ xy]$

569. $(a + b) \cdot (a - b) - (a - b)^2$. $\qquad [2ab - 2b^2]$

570. $(a + b)^2 + (a - b)^2; \qquad 2(a - b)^2 \cdot (a + b) - 2 \cdot (a + b)^2 \cdot (a - b)$. $\qquad [2a^2 + 2b^2; \ 4b^3 - 4a^2b]$

571. $(2a + 3)^3 - 6[(2a - 3)^2 + 4a(2a + 3)]$. $\qquad [8a^3 - 36a^2 + 54a - 27]$

572. $\left[\dfrac{5}{9} + \left(\dfrac{3}{4}a - \dfrac{2}{3}\right)^2 + \dfrac{23}{16}a^2\right] \cdot (1 + 2a^2 - a) - \left[\left(a + \dfrac{1}{4}\right)^2 \cdot 2 - \dfrac{9}{8}\right] \cdot (2a^2 + a - 1)$. $\qquad [8a^2 - 8a^3]$

573. $(a + 1)(a - 1) \cdot (a^4 + a^2 + 1)$. $\qquad [a^6 - 1]$

574. $(x + y) \cdot (x^3 - y^3) \cdot (x^2 - xy + y^2) - x^6 + y^6$. $\qquad [0]$

575. $\left(\dfrac{1}{2}x^2 + \dfrac{3}{4}y\right) \cdot \left(\dfrac{1}{2}x^2 - \dfrac{3}{4}y\right) + \left(\dfrac{3}{4}x^2 + y\right) \cdot \left(\dfrac{3}{4}x^2 - y\right) + 3\left(\dfrac{x^2}{4}\right)^2$. $\qquad \left[x^4 - \dfrac{25}{16}y^2\right]$

576. $(a - b)^3 + 3(a - b)^2(a + b) + 3(a - b)(a + b)^2 + (a + b)^3$. $\qquad [8a^3]$

577. $(a^2 - b^2) \cdot (a^2 + b^2) + 2b \cdot (a + b) \cdot (a^2 - ab + b^2) - (a + b)^2 \cdot (a - b)^2$. $\qquad [2a^3b + 2a^2b^2]$

578. $\dfrac{1}{4}(x + y)^2 - \dfrac{1}{4}(x - y)^2 - xy + \left(\dfrac{x}{2} + y\right)^2 - y \cdot (x + 2y) - \left(\dfrac{x}{2} + y\right)\left(\dfrac{x}{2} - y\right)$. $\qquad [0]$

579. $(3x + 1)^2 + (4x + 3)^2 - 2(5x + 3)$. $\qquad [25x^2 + 20x + 4]$

580. $2(x^3 + y^3 + z^3 - 3xyz) - (x + y)^3 - (y + z)^3 - (x + z)^3 + 3(y + z)(x + z)(x + y)$. $\qquad [0]$

581. $a^4 + 4(a - b)^4 - 6(a - 2b)^4 + 4(a - 3b)^4 - (a - 4b)^4 + 24b^4$. $\qquad [2a^4]$

582. $18a^2 - (2 - a^2) \cdot (2 + a^2) + (5a^2 + 2) \cdot (1 - 7a^2) + 9a^2(2a + 1)(2a - 1) - 6$. $\qquad [2a^4 - 8]$

583. $\frac{1}{3}xy + (2x + 3y)^2 - \left(\frac{1}{2}x + \frac{1}{3}y\right)^2 + (2x - 3y)^2 - \frac{31}{4}x^2 - \frac{161}{9}y^2.$ $\qquad$ [0]

584. $15 + \left[\left(\frac{1}{2}a - 1\right)^2 - \frac{1}{4}a^2\right]^2 \cdot (1 + a)^2 - \left[a^2 - \left(\frac{1}{2} - a\right)^2 - \frac{7}{4}\right]^2 \cdot (a + 2)^2.$ $\qquad$ $[6a^2]$

585. $x^2y^4 - \left(\frac{2}{3}x^2 + y^2\right)^3 - \left(\frac{2}{3}x^2 - y^2\right)^3 + \frac{4}{3}x^2\left(\frac{2}{3}x^2 + y^2\right) \cdot \left(\frac{2}{3}x^2 - y^2\right) + \frac{10}{3}x^2y^4.$ $\qquad$ $[-x^2y^4]$

586. $2a^2 + 8(a - 1)^3 + 4(a - 1)^2 + (a^2 - 4a + 2)^2 - a^2(a^2 - 1).$ $\qquad$ $[3a^2]$

587. $b^3 + (3a - 4b)^3 + (4a - 3b)^3 + 252ab(a - b) + 90(b^3 - a^3).$ $\qquad$ $[a^3]$

588. $3a^2 + (3b + 2a) \cdot (3b - 2a) + (3a - b) \cdot (3a + b) - 2(b - a)(a + b).$ $\qquad$ $[10a^2 + 6b^2]$

589. $[(x + 2)^3 - (x - 2)^3 - 4(3x^2 - 1)] \cdot \frac{1}{10}.$ $\qquad$ [2]

590. $\left\{[(a - 2b)(a + 2b) + 3a^2]\frac{1}{4}\right\}(a^2 + b^2) - a^2(a^2 - b^2) - b^2(a^2 - b^2).$ $\qquad$ [0]

591. $(x + y + z)^3 - (x^3 + y^3 + z^3) - 3(x + y) \cdot (x + z) \cdot (y + z).$ $\qquad$ [0]

592. $(x - y)^2 + (x + y + z + t)^2 + (x - z)^2 + (x - t)^2 + (y - z)^2 + (y - t)^2 + (z - t)^2.$ $\qquad$ $[4x^2 + 4y^2 + 4z^2 + 4t^2]$

593. $(a^3 + 2a^2 + 2a + 1) \cdot (a^3 - 2a^2 + 2a - 1).$ $\qquad$ $[a^6 - 1]$

594. $x(x^2 - 10xy + 5y^2)^2 + y(5x^2 - 10xy + y^2)^2 - (x + y)^5.$ $\qquad$ [0]

595. $\left(\frac{1}{2}x + 3y\right)^2 - \left(\frac{1}{2}x - 2y\right)^2.$ $\qquad$ $[5xy + 5y^2]$

596. $(a + b + c)^3 - (b + c - a)^3 - (a - b + c)^3 - (a + b - c)^3.$ $\qquad$ $[24abc]$

597. $6xyz + (x + y)^3 + (y + z)^3 + (x + z)^3 - (x + y + z)^3.$ $\qquad$ $[x^3 + y^3 + z^3]$

598. $7ab(a + b)(a^2 + ab + b^2)^2 - (a + b)^7.$ $\qquad$ $[-a^7 - b^7]$

599. $(x + z) + (x + y + z)^3 - (x^3 + y^3 + z^3) - 3(x + y)(y + z)(x + z).$ $\qquad$ $[x + z]$

600. $1 + [4a^2 + (a + 1)^2 \cdot (a - 1)^2 - (a^2 + 1)^2] \cdot (a + b)^3 + a^3 + b^3 + 3ab(a + b) - (a + b)^3.$ $\qquad$ [1]

601. $(a + 1)(a + 2) \cdot (3 - a)(4 - a) + 26 + a(a - 3) \cdot (a + 4) \cdot (a + 3) -$
$-2(a - 1)(5 + a) \cdot (a + 1) \cdot (a - 5) - 36a^2.$ $\qquad$ $[-14a]$

602. $5a^2 - (a + 1) \cdot (a + 2) \cdot (a + 3) + (a + 1)(a + 2) + a^3 + 4(2a + 1).$ $\qquad$ [0]

603. $(a + b + c)^2 + (a - b)^2 + (a - c)^2 + (b - c)^2 - 3(b^2 + c^2) - 3a^2.$ $\qquad$ [0]

604. $(a - 1)(a + 1) - (b^2 + 3) \cdot (4 - b) + [(a^2 + b - 3) - (2b + a^2 - 4)]^3.$ $\qquad$ $[a^2 - b^2 - 12]$

605. $(x - 1)^8 : (x - 1)^6 - x[(x - 1)^8 : (x - 1)^5 - (x - 1)^3 + 1] \cdot [(x - 1)(x + 1)] + x^3.$ $\qquad$ $[x^2 - x + 1]$

606. $(x - 3y)(x + 3y)(x^2 + 9y^2) - 9(x^4 - 9y^4).$ $\qquad$ $[-8x^4]$

607. $(a + b)(a - b) - a(a - 2b).$ $\qquad$ $[2ab - b^2]$

608. $(p^2 + 1)(p + 1)(p - 1) - p^3(p - 1) + (1 - p)(p^2 + p + 1).$ $\qquad$ [0]