Esercizi di consolidamento

Semplifica le seguenti espressioni togliendo le parentesi in una sola volta.

1 $a^2 - 1 + \left\{-x^2 - \left[\frac{1}{2}a^2 + \left(-x^2 + \frac{1}{2}a^2\right) + 1\right] + 2a^2\right\}$ $[2a^2 - 2]$

2 $\frac{1}{5}a^2b - \left[3x + a^2b - \left(\frac{1}{3}x + \frac{1}{2}a^2b\right)\right] + \frac{8}{3}x$ $\left[-\frac{3}{10}a^2b\right]$

3 $\left(\frac{5}{6}ab - \frac{1}{4}a^2b + \frac{3}{5}a^2b^2\right) - \left(\frac{1}{3}ab + \frac{3}{4}ab^2 - \frac{1}{4}a^2b\right) - \left(\frac{5}{2}ab^2 + \frac{1}{10}a^2b^2\right)$ $\left[\frac{1}{2}a^2b^2 - \frac{13}{4}ab^2 + \frac{1}{2}ab\right]$

4 $\left(\frac{1}{2}a^4 + 3a^3b^2 - \frac{5}{4} + 3a\right) - \left(-\frac{3}{5}a^4 - 1 + \frac{13}{6}a\right) + \left(-\frac{4}{3}a^3b^2 + \frac{1}{4} - \frac{5}{6}a\right)$ $\left[\frac{11}{10}a^4 + \frac{5}{3}a^3b^2\right]$

5 $\left(\frac{1}{4} + 2x^2 + a\right) - \left(\frac{3}{5}a^2x - \frac{1}{3}a\right) - \left[-\left(-2x^2 + \frac{1}{2}\right) + \left(\frac{1}{3}a^2x - \frac{1}{6}a\right)\right]$ $\left[\frac{3}{4} + \frac{3}{2}a - \frac{14}{15}a^2x\right]$

6 $(2x - 3y) - \left\{-\left[x^2 - (2x - y) + \left(5y - \frac{3}{4}x^2\right)\right] + \left(2x + \frac{3}{2}y\right)\right\}$ $\left[\frac{1}{4}x^2 - 2x + \frac{3}{2}y\right]$

7 $\left(a^2 + \frac{2}{3}b^2 + c^3\right) - \left[+\left(\frac{1}{3}a^2 - \frac{1}{3}b^2 + \frac{3}{4}c^3\right) - \left(\frac{1}{6}a^2 + \frac{1}{2}b^2 - \frac{1}{4}c^3\right)\right]$ $\left[\frac{5}{6}a^2 + \frac{3}{2}b^2\right]$

8 $\left(\frac{5}{12}x^2yz + \frac{19}{9}xy^2 + \frac{1}{10}x^3yz\right) - \left(-\frac{20}{9}xy^2z\right) - \left(\frac{4}{5}x^3yz + \frac{5}{3}xy^2z\right) - \left[\left(\frac{1}{2}x^2yz + \frac{1}{9}xy^2 + \right.\right.$

$\left.\left. - \frac{3}{10}x^3yz\right) + \left(\frac{5}{9}xy^2z - \frac{3}{4}x^2yz - \frac{2}{5}x^3yz + \frac{2}{3}x^2yz\right)\right]$ $[2xy^2]$

9 $\left(\frac{4}{3}yz^2 - \frac{1}{3}yz + \frac{2}{3}x^2z^3\right) - \left(xy - \frac{1}{2}y^2 - \frac{2}{5}yz + \frac{3}{20}y^2\right) - \left[\left(\frac{2}{3}yz^2 + \frac{4}{5}yz^2\right) - \left(\frac{2}{15}yz - x^2z^3 + \right.\right.$

$\left.\left. + \frac{1}{3}x^2z^3\right) - \left(-\frac{1}{5}yz\right) - \left(xy + \frac{1}{4}y^2 - \frac{3}{5}y^2\right)\right]$ $\left[-\frac{2}{15}yz^2\right]$

10 $\frac{5}{2}x^2y - \frac{1}{4}xy + \frac{1}{2}xy^3z - \frac{3}{4}x^2y - \left(\frac{1}{4}xy + \frac{1}{12}xy^3z\right) + \left[\left(\frac{1}{3}xy^3 - 2x^4y - \frac{3}{8}x^2y\right) - \left(\frac{3}{8}x^2y + x^2y\right)\right] +$

$- \left(\frac{5}{12}xy^3z - \frac{1}{2}xy + \frac{1}{3}xy^3 - 3x^4y\right)$ $[x^4y]$

11 $\left(yz^2 + \frac{1}{2}xy + x^2y^2\right) - \left[\left(\frac{1}{2}x^2y^2 + \frac{2}{3}x^2y\right) + \left(\frac{2}{15}x^2z + \frac{1}{5}x^2y^2 + \frac{2}{3}yz^2\right)\right] - \left[\left(\frac{1}{3}yz^2 - \frac{2}{9}x^2y + \right.\right.$

$\left.\left. + \frac{1}{4}xy\right) + \left(\frac{3}{10}x^2y^2 - \frac{1}{3}x^2y\right) - \left(\frac{2}{15}x^2z - \frac{1}{4}xy\right)\right]$ $\left[-\frac{1}{9}x^2y\right]$

Semplifica le seguenti espressioni contenenti prodotti notevoli.

12 $[(2y-1)^2+(0{,}5x+2y-1)(0{,}5x-2y+1)] : \left(\frac{1}{8}x^2\right)$ [2]

13 $\left[(3a^2b-4ab^2)^2-\left(3a^2b+\frac{1}{2}ab^2\right)\left(3a^2b-\frac{1}{2}ab^2\right)+24a^3b^3\right] : (-2ab)$ $\left[-\frac{65}{8}ab^3\right]$

14 $\left\{[(-2x+3y)(2x+3y)(4x^2+9y^2)+16(x^2-2y^2)(x^2+2y^2)] : (-17y^2)\right\}^2$ $[y^4]$

15 $(2x-y)^2+(2x+y)^2-[(3y-2x)(3y+2x)-9y^2] : (-2x)-x(8x-2)$ $[2y^2]$

16 $\left[\left(a-\frac{1}{3}b\right)^2-a^2\right] : \left(-\frac{1}{3}b\right)\left(2a+\frac{1}{3}b\right)+\left(-\frac{2}{3}\right)\left(\frac{9}{4}a^2-\frac{1}{6}b^2\right)$ $\left[\frac{5}{2}a^2\right]$

17 $(2x-1)(2x+1)+(6x^2y-3xy) : (-3xy)+(12x^3y^2-6x^2y^3+8x^4y^2) : (-2x^2y^2)$ $[3y-8x]$

18 $\left[\left(\frac{2}{3}x+\frac{9}{4}y\right)^2-\left(-\frac{9}{4}y\right)^2\right] : \left(\frac{2}{3}x\right)-\left(\frac{1}{3}x+1\right)^2+1$ $\left[\frac{9}{2}y-\frac{1}{9}x^2\right]$

19 $\left[\left(10x^2y^3-\frac{1}{3}x^4y^2+5x^5y^3\right) : \left(\frac{5}{3}x^2y^2\right)-3y(2-x^3)\right] : \left(-\frac{1}{5}x^2\right)+30xy$ [1]

20 $[(3x+2y)(2x-3y)-6(x-y)(x+y)] : (-5xy)+8-\left(\frac{2}{3}x-3\right)\left(\frac{2}{3}x+3\right)$ $\left[18-\frac{4}{9}x^2\right]$

21 $\left\{-\left[\frac{1}{5}x(5+10x)-7x^6 : \left(\frac{7}{2}x^4\right)\right]\cdot 2x^3-4+(x^2+2)^2\right\} : (-2x)^2$ $\left[1-\frac{1}{4}x^2\right]$

22 $[(2x+3)(4x^2-6x+9)-(2x+3)^3] : (-18x)+(x-1)(x+2)-1$ $[x^2+3x]$

23 $\left\{(-2a)^5 : (2a)^4+(a+2)^2-2\left[(-2a)^3\right]^2 : \left[(-2a)^2\right]^2-2(a+2)\right\}^2-(-7a)^2$ $[49a^4-49a^2]$

24 $\left(\frac{3}{4}a^2x-\frac{1}{2}ax\right) : \left(-\frac{1}{2}ax\right)+\left(\frac{1}{5}a^3x^2-\frac{1}{2}a^2x^3-\frac{2}{5}a^2x^2\right) : \left(+\frac{2}{5}a^2x^2\right)$ $\left[-a-\frac{5}{4}x\right]$

25 $\left\{\left[\left(2a^2b^3-\frac{1}{4}a^5\right)(-4a)+(2ab+1)(4a^2b^2-2ab+1)\right]^2-1\right\} : a^6$ $[a^6+2]$

26 $[y^3+3y(x-1)(x-1+y)] : (-2y)+3\left[\left(x+\frac{1}{2}y\right)\left(\frac{1}{2}x-1\right)+\frac{1}{2}\right]$ $\left[-\frac{1}{2}y^2-\frac{3}{4}xy\right]$

27 $\left\{\left[(x^2+y^2)^2+x^2y^2-2xy(x^2+y^2)-(x^4+y^4)\right] : (-xy)-2(x^2+y^2)\right\} : (-xy)$ [3]

28 $\left\{[(2a+t)^3-(2a+t)(4a^2-2at+t^2)] : (-6at)+t\right\} : (-2a)$ [1]

29 $\left\{[(x-y)^2(x+y)-(x-y)(x+y)^2] : (-2y)+y^2\right\}^2 : (-x)^4$ [1]

30 $[(a+2b)^2+4(a^2-3b^2)-2(a+2b)(a-2b)+3a(-a+3b)] : \left(-\frac{13}{5}ab\right)$ [−5]

31 $\left[3x^2-\frac{2}{3}x\left(3x-\frac{3}{4}y\right)-\frac{1}{3}y(x+6y)\right](x-3y)-(x-6y)(x^2-y^2)$ $\left[\frac{19}{6}x^2y-\frac{3}{2}xy^2\right]$

32 $[(2a-b)(2a+b)+1]^2-(a^2+b^2-1)^2-5a^2(3a^2+2)$ $[-10a^2b^2]$

33 $(2a+3b-1)(2a-3b+1)-2\left[(a-2)(a+2)+(b-2)^2\right]+(3b+2)^2-2(a-b)(a+b)$ $[26b+3]$

34 $(a-2x+1)(a+2x-1)+(2x-1)^2+a^2(2a+1)(2a-1)$ $[4a^4]$

35 $\left[(x-2)(x+2)(x^2+4)\right]^2-\left[(2x-1)(2x+1)(4x^2+1)\right]^2-20(3-4x^4)(3+4x^4)$ $[65x^8+75]$

Esegui le seguenti divisioni.

36 $(a^5+a^4+2a^3+3a^2-a+5):(a^2-a+1)$ $[Q(a)=a^3+2a^2+3a+4;\ R(a)=1]$

37 $\left(-\frac{4}{3}m^3-m+2m^4-\frac{8}{3}m^2\right):\left(\frac{1}{3}m^2-\frac{1}{2}\right)$ $\left[Q(m)=6m^2-4m+1;\ R(m)=-3m+\frac{1}{2}\right]$

38 $\left(\frac{3}{2}m^5-5m^2+\frac{17}{10}m^3-2\right):(5m^2-1)$ $\left[Q(m)=\frac{3}{10}m^3+\frac{2}{5}m-1;\ R(m)=\frac{2}{5}m-3\right]$

39 $\left(\frac{5}{2}a^6+\frac{1}{3}a^5-\frac{1}{4}a^4-\frac{11}{2}a^3-1\right):\left(\frac{1}{2}a^3-1\right)$ $\left[Q(a)=5a^3+\frac{2}{3}a^2-\frac{1}{2}a-1;\ R(a)=\frac{2}{3}a^2-\frac{1}{2}a-2\right]$

40 $(x^6-6x^4+5x^3+8x^2-14x+5):(x^2-3)$ $[Q(x)=x^4-3x^2+5x-1;\ R(x)=x+2]$

41 $(y^6-4):(y^3-1)$ $[Q(y)=y^3+1;\ R=-3]$

Applicando lo schema di Ruffini, determina quoziente e resto delle seguenti divisioni.

42 $(y^2+y-1):(y+3)$ $[Q(y)=(y-2);\ R=+5]$

43 $(2x^3-7x^2-8):(x-1)$ $[Q(x)=2x^2-5x-5,\ R=-13]$

44 $(x^3-2x^2+x+1):(x-2)$ $[Q(x)=(x^2+1);\ R=+3]$

45 $(2x^3+7x^2+5x-6):(x+2)$ $[Q(x)=(2x^2+3x-1);\ R=-4]$

46 $(2y^3+5y^2+2y-1):\left(y+\frac{1}{2}\right)$ $[Q(x)=(2y^2+4y);\ R=-1]$

47 $(2x^4+3x^3-x^2+5):(2x-1)$ $\left[Q(x)=x^3+2x^2+\frac{1}{2}x+\frac{1}{4};\ R=\frac{21}{4}\right]$

48 $(x^3-3x^2+4x-1):(2x-3)$ $\left[Q(x)=\frac{1}{2}x^2-\frac{3}{4}x+\frac{7}{8};\ R=\frac{13}{8}\right]$

49 $(3x^4-6x^2+x-9):(3x+4)$ $\left[Q(x)=x^3-\frac{4}{3}x^2-\frac{2}{9}x+\frac{17}{27};\ R=-\frac{311}{27}\right]$

50 $\left(x^3-\frac{1}{3}x^2-2x-\frac{11}{3}\right):(x-1)$ $\left[Q(x)=\left(x^2+\frac{2}{3}x-\frac{4}{3}\right);\ R=-5\right]$

51 $(y^3-3by^2+b^2y-3b^3):(y-3b)$ $[Q(y)=y^2+b^2]$

52 $\left(y^3+ay^2-\frac{3}{4}a^2y+a^3\right):\left(y-\frac{1}{2}a\right)$ $\left[Q(y)=y^2+\frac{3}{2}ay;\ R=a^3\right]$

53 $(2a^3x^3-3a^2x^2+3ax+1):(ax-1)$ $[Q(x)=2a^2x^2-ax+2;\ R=3]$

54 $(x^4 + 3bx^3 - 4b^2x^2 + b^3x - 8b^4) : (3x - 2b)$ $\left[Q(x) = \frac{1}{3}x^3 + \frac{11}{9}bx^2 - \frac{14}{27}b^2x - \frac{1}{81}b^3;\ R = \frac{650}{81}b^4\right]$

55 $\left(x^4 - 2x^3y + x^2y^2 - 4y^4\right) : (x - 2y)$ $[Q(x) = x^3 + y^2x + 2y^3;\ R = 0]$

56 $\left[by^4 + b^2y^3 + (b+1)y^2 - (3b - b^2)y + b^2\right] : (y + b)$ $[Q(y) = by^3 + (b+1)y - 4b;\ R = 5b^2]$

Semplifica le seguenti espressioni riassuntive.

57 $\left(\frac{3}{2}a + b\right)\left(\frac{1}{2}b + 1\right) + a\left(\frac{5}{2} + a\right) - \left[(a-b)(a+2b-1) + \left(-\frac{1}{4}ab\right)\right]$ $\left[5a + \frac{5}{2}b^2\right]$

58 $\left(y - \frac{2}{3}\right)\left(\frac{1}{2}x + 1\right) + \frac{2}{3} - \left[(2y+1)\left(\frac{5}{2} + \frac{1}{4}x\right) + \left(1 - \frac{5}{12}\right)(-x)\right]$ $\left[-4y - \frac{5}{2}\right]$

59 $\frac{1}{3}a(3a-5) + a^2b^2 + (ab-1)\left(\frac{2}{3}ab + \frac{3}{4}\right) - \left[\left(a + \frac{1}{3}\right)(a-2) + \frac{1}{12}(5ab+4)(4ab-3)\right]$ $\left[\frac{11}{12}\right]$

60 $(a+b)\left(\frac{1}{2}a - \frac{1}{2}b + 2\right) - (2b+1)\left(\frac{1}{4}a + 3\right) + \left(-\frac{1}{2}\right)(a+b)(a-b) + 4b + 3$ $\left[\frac{7}{4}a - \frac{1}{2}ab\right]$

61 $\frac{4}{3}a^2 + (x-3a)(x+2a) - \left(\frac{1}{2}x^2 - a\right)\left(\frac{2}{3}a + 1\right) - \left[(x+a)\left(\frac{1}{2}x - 3a\right) - \frac{1}{3}a(x^2-3)\right]$ $\left[\frac{3}{2}xa - a^2\right]$

62 $\left(x - \frac{1}{2}a\right)(x+1) - ax - \left[\frac{1}{2}(2x+a)(x-a) + (x+1)(-ax)\right] - a\left(x^2 - \frac{1}{2}\right)$ $\left[x + \frac{1}{2}a^2\right]$

63 $(x+y)\left(\frac{2}{3}z - 3\right) + x\left(-\frac{8}{3}z + 1 + 4x\right) - \left[2(2x+z)(x-z) - 2x + \frac{2}{3}y(z-3)\right]$ $[2z^2 - y]$

64 $(a+x)(a-x) + \left(2a - \frac{1}{2}x\right)^2 - \left[\frac{1}{4}(5a-x)(4a+x) - 9a - \frac{1}{2}(x-1)^2\right] - 9a\left(1 - \frac{1}{4}x\right)$ $\left[\frac{1}{2} - x\right]$

65 $\left\{(3x+a)(x-a) + a^2(1-2x^2) - \left[(x+1)(3x-1) - (-2xa)^2\right] + 2x(a+1)\right\}(2a^2x^2 - 1)$ $[4a^4x^4 - 1]$

66 $\left(x - \frac{1}{2}\right)\left(x + \frac{1}{2}\right) - 5ax + (a+1)^2 - \left[(2x-a)^2 - (x-1)\left(\frac{2}{3}x + 2a\right) - \frac{1}{3}x(7x+2)\right]$ $\left[ax + \frac{3}{4}\right]$

67 $\frac{1}{4}x^2y + (6y+2)\left(1 + \frac{4}{3}y^2\right) - \left\{\left(\frac{1}{2}xy + 1\right)\left(2 + \frac{1}{2}x\right) - \left[(-2y)^3 + \frac{1}{2}x + (-3y)\left(\frac{8}{9}y + 2\right)\right]\right\}$ $[-xy]$

68 $\left(ax - \frac{1}{2}b + 1\right)\left(ax - 1 + \frac{1}{2}b\right) - \left(ax - 1 + \frac{1}{2}b\right)^2 - (2-b)\left(ax - 1 + \frac{1}{2}b\right)$ $[0]$

69 $\left(1 + \frac{5}{4}ay^2\right)(y-2) + y\left[x\left(\frac{1}{8}y^2 + a\right) + y\left(\frac{5}{2}a - 1\right)\right] - \frac{11}{8} - \left[(x+2a)\left(\frac{1}{2}y\right)^3 + (ay-1)(y^2+x) + \right.$

$\left. + \left(-\frac{3}{2}\right)^3\right]$ $[x+y]$

70 $4\left(\frac{2}{3}y^2-\frac{1}{2}\right)+(4xy-1)^2+x[1-x(4y^2+9)-y]-\left[\left(\frac{9}{2}x^2+1\right)\left(\frac{8}{3}y^2-2\right)-xy\right]$ $[x-8xy+1]$

71 $-\frac{1}{2}ax+\left(\frac{1}{3}x-\frac{1}{2}a\right)\left(\frac{3}{2}a-\frac{4}{3}bx\right)-\left[\left(\frac{1}{4}a+3x\right)\left(-3a+\frac{8}{3}bx\right)-b\left(\frac{2}{3}x\right)^2\right]-[3x(3a+2bx)+$
$-2b(x-2)(x+2)]$ $[-8b-12bx^2]$

72 $[(a+b)(a+2b-1)-3ab]\left[\frac{1}{2}a-(a+1)(b-2)\right]-\frac{1}{2}a^3(5-2b)+\frac{1}{2}(a+5b)(a-2b)+$
$+2b^2(b-1)(a+1)+2(b+1)^2+2a(1-2b^2)$ $[2b+2]$

73 $(x+2a)^3+\left(\frac{3}{4}x^2-1\right)\left(2a-\frac{1}{2}x+2\right)-\left[\left(\frac{1}{2}x+a\right)^2\left(\frac{5}{2}x+8a+6\right)-6\left(a+\frac{1}{2}\right)^2+3ax\left(x+\frac{1}{2}a-2\right)\right]$
$\left[4a+\frac{1}{2}x-\frac{1}{2}\right]$

74 $3(x^2+1)+(x-2)(x-1)+x(ax-1)(ax-3)-\left[2(x-2)^2+x(ax-3)^2+(2x+5)(x-1)\right]$
$[2ax^2-4x+2]$

75 $\left[(x-a)(x+a)-(x-a)^2+(2a)^2\right]^2-\left\{(2a^2+x^2)^2-x\left[(-2a)^3+x^3+2\right]\right\}$ $[2x]$

76 $(ax-1)^3-(x+2)^3-\left[(ax+3)(2ax-3)-x(x+4)(x+3)+(2ax)^2\left(\frac{1}{4}ax-\frac{3}{2}\right)\right]-x^2(a-1)(1+a)$
$[2x^2]$

77 $\left(\frac{1}{3}ax-\frac{2}{3}\right)^2(-9a)+(x+a^2)(x-a^2)-[(a^2-1)(4x-a^2)-4a+x^2(1-a^3)]$ $[4x-a^2]$

78 $2\left[(a^3-x)^2+2a^2(2+ax)-(x-2a)(2a+x)\right]-\left[(a+x-1)(a+1-x)+(x-1)^2\right]^3-(-4a)^2$ $[a^6]$

79 $\left(x+\frac{1}{2}\right)(x^2+2x+2)-\left[\left(x-\frac{1}{3}\right)\left(x+\frac{1}{3}\right)-\frac{1}{3}(5ax-2a^2)+\frac{3}{4}\right]-\left[\left(x+\frac{1}{2}\right)^3+x+\right.$
$\left.-\frac{1}{3}(2a+x)(a-3x)+\frac{1}{9}-\left(x-\frac{1}{2}\right)^2\right]$ $\left[\frac{1}{4}x+\frac{3}{8}\right]$

80 $(x+y+z)^2-(x-y-z)^2-2x^2(y+z)+(x-y)^3-\{4xz-2x(-2y+xz+2y^2)+$
$-[(x^2-3y)(x^2-2y)+y(5x-y)(2x-y)]\}$ $[x^3+x^4+6y^2]$

81 $\left[\left(x+\frac{1}{3}a\right)^2-\frac{1}{9}a^2\right]\left(x^2-\frac{2}{3}ax\right)+\left[(ax+1)(ax-2)-a^2x^2\right]^2-[(x-a)(a+x)(2a^2+x^2)+$
$+4(ax+1)-\left(-\frac{2}{3}ax\right)^2\Big]$ $[2a^4]$

82 $\left(x-\frac{3}{2}z\right)\left(x+\frac{1}{2}z\right)-\frac{2}{9}y(-2y+6x-3z)-2z^2\left(z-\frac{1}{2}\right)-\left[\left(x-\frac{2}{3}y-\frac{1}{2}z\right)^2+(x+z)^3+\right.$
$\left.-(x^2+z^2)(3z+3x)\right]$ $[2x^3]$

83 $(x-z)^2+\left(\frac{1}{2}y+x-z\right)\left(\frac{1}{2}y+z-x\right)-\left[\left(x+\frac{3}{2}z\right)\left(x+\frac{1}{2}z\right)-(x+3z)(x-z)+\right.$

$\left.+\left(\frac{1}{2}y-2z\right)\left(\frac{1}{2}y+2z\right)\right]$ $\left[\frac{1}{4}z^2\right]$

84 $\left\{\left[\left(x+\frac{4}{5}y\right)\left(x-\frac{5}{4}y\right)+y^2\right]:x\right\}^2-\left(x-\frac{5}{4}y\right)^2-\frac{2}{5}y\left(4x-\frac{7}{5}y\right)$ $\left[-\frac{4}{5}y^2\right]$

85 $(x+2a)^3+(x+2a)(2x+a)-\left[\left(\frac{3}{2}x+a\right)^2-\left(\frac{1}{2}x-a\right)\left(\frac{1}{2}x+a\right)\right]-x[(x+6a)(x+2a)-2a(x-1)]$

$[8a^3]$

86 $\left[\left(\frac{3}{5}ab^2-\frac{1}{10}ab\right):\left(\frac{1}{2}ab-\frac{1}{5}ab\right)\right]^2-(6ab-a)\left(2ab+\frac{1}{3}a\right):(3a^2)$ $\left[\frac{2}{9}-\frac{4}{3}b\right]$

87 $\left\{\left[\left(\frac{1}{3}a-b\right)^2\left(\frac{1}{3}a+b\right)^2-b^4\right]:\left(+\frac{1}{9}a^2\right)+\left(2b-\frac{1}{3}a\right)\left(2b+\frac{1}{3}a\right)\right\}:\left(-\frac{1}{2}b\right)$ $[-4b]$

88 $[(a^2x^2+1)(a^2x^2-1)+1]:\left(\frac{1}{3}a^3x^3\right)+[(ax-1)(ax+a)-a(ax-x-1)]:(ax)$ $[4ax]$

89 $\{5[(ab)^3:(a^2b^3)]+2b\}^2+\left[\left(a-\frac{2}{5}ab^2\right)(5a-2ab^2)-5a^2\right]:\left(\frac{1}{2}ab\right)-(a+2b)(5a+2b)$

$\left[20a^2+\frac{8}{5}ab^3\right]$

90 $\left\{[(x+2)^3-8]:x-\frac{1}{2}\left(\frac{1}{2}x+3\right)(x+4)-6\right\}:\left(\frac{1}{4}x\right)-(2x-3)^2$ $[15x-4x^2+5]$

91 $[(ab-ac)^2(bc)^2]:\left[(abc-1)^2+\frac{1}{2}(2abc-1)(2abc+3)+\frac{1}{2}\right]+\frac{2}{3}bc$ $\left[\frac{1}{3}b^2+\frac{1}{3}c^2\right]$

92 $\left[4a(1-ax)+\left(\frac{1}{3}ax-\frac{2}{3}\right)^2(-9a)+(x+a^2)(x-a^2)-x^2\right]:\left(-\frac{1}{2}a^3\right)-2\left(x-\frac{1}{2}a\right)\left(x+\frac{1}{2}a\right)$

$\left[2a+\frac{1}{2}a^2\right]$

93 $\left[(ax+bx)\left(ax-\frac{1}{2}bx\right)^2-\frac{1}{4}b^3x^3\right]:\left[\frac{1}{2}(xa)^5:(2a^4x^2)\right]+(2b-3a)(3a+2b)$ $[b^2-5a^2]$

94 $\left[(xy+xz)^3:(8x^3)-\left(\frac{1}{2}y-z\right)^3\right]:\left[\left(-\frac{1}{2}\right)^3((z+10)(z-1)-z^2+10)\right]+(y-z)(y+z)$

$[yz-2z^2]$

95 $[(x+2z)^3-4(3xz^2+2z^3)]:[(4a-x)(x+a)-3ax-(-2a)^2]$ $[-x-6z]$

96 $\{[(x+y)^2+x+1][(x+y)^2-x-1]-(x+y)^4+1\}:(-2x)-\left(\frac{1}{4}x-1\right)^2$ $\left[x-\frac{1}{16}x^2\right]$