계산시 참고사항

1. 단항식과 다항식의 곱셈

: 분배법칙을 이용하여 단항식을 다항식의 각 항에 곱하여 간단히 한다.

$$\underset{\text{①}\ \text{②}}{A(B+C)} = \underset{\text{①}}{AB} + \underset{\text{②}}{AC}$$

(전개 : ①, ② 방향 / 전개식 : $AB+AC$)

2. 다항식과 단항식의 나눗셈

(방법1) $(A+B)\div C = \dfrac{A+B}{C} = \dfrac{A}{C} + \dfrac{B}{C}$

➡ 분수꼴로 나타낸 다항식의 각 항을 단항식으로 나누어 계산한다.

(방법2) $(A+B)\div C = (A+B)\times \dfrac{1}{C} = \dfrac{A}{C} + \dfrac{B}{C}$

➡ 나눗셈을 곱셈으로 바꾼 후 분배법칙을 이용하여 계산한다.

3. 덧셈, 뺄셈, 곱셈, 나눗셈이 혼합된 식의 계산 순서

(1) 지수법칙을 이용하여 거듭제곱을 먼저 정리한다.
(2) 괄호가 있으면 괄호 안을 먼저 계산한다. 이때 괄호는 소괄호( ), 중괄호{ }, 대괄호[ ]순으로 계산한다.
(3) 분배법칙을 이용하여 곱셈, 나눗셈을 계산한다.
(4) 동류항끼리 덧셈, 뺄셈을 계산한다.

전개와 전개식

◉ 전개 : 단항식과 다항식의 곱을 하나의 다항식으로 나타내는 것

◉ 전개식 : 전개하여 얻은 다항식

단항식과 다항식의 곱셈

◪ 다음 식을 간단히 하여라.

1. $-4x(5x-4)$

2. $5x(3x+2)$

3. $2a(5b-3)$

4. $(3a+4)a$

5. $-3y(-2x+1)$

6. $(2x+3)\times(-2x)$

7. $(-x+y)\times(-3x)$

8. $(3x+2y)\times 2x$

9. $(-4a+5)\times 3a$

10. $2x^2(3xy-4y)$

ECN-0199-2015-001-000666229

11. $(x^2+3x-5)\times 4x$

12. $(12a^2+4a-8)\times\frac{1}{4}a$

13. $\frac{3}{2}a(-6a^2b-12ab+18b^3)$

14. $(-3x+2y+1)\times 2x$

15. $5x(-x+2y-6)$

16. $(8x-4y+12)\times\left(-\frac{x}{2}\right)$

17. $(4a+2b-8)\times\left(-\frac{a}{2}\right)$

18. $(-x-4y+3)\times(-3y)$

19. $(8a^2-5b+3)\times 2ab$

20. $(6x^2-4xy+10y^2)\times 3xy$

21. $2x(3x-5y+2)$

22. $-3x(x-5y+1)$

23. $-3a(a-4b+1)$

24. $2a(5a-b+7)$

25. $\frac{1}{2}a(4a-6b+10)$

26. $-\frac{1}{3}b(2a-6b+9)$

27. $2x(4x-3y+2)$

28. $6x(-x+2y-3)$

29. $-5a(-3a+2b-3)$

30. $(3a-4b+2)\times 2a$

31. $(-a+3b-4)\times(-3a)$

32. $(-12x+4y-8)\times\frac{1}{4}x$

다항식과 단항식의 나눗셈

◪ 다음 식을 간단히 하여라.

33. $(8x^2-12x)\div 4x$

34. $(5ab-3a)\div a$

35. $(16xy-4y)\div 2y$

36. $(12x^2-24xy)\div 3x$

37. $(x^2y-2xy^2)\div xy$

38. $(7x^2-2xy)\div(-x)$

39. $(15xy-6y)\div(-3y)$

40. $(9a^3b-6a^2)\div(-3a)$

41. $(8x^2y+20xy^2)\div(-4x)$

42. $(15x^2y-9xy^2)\div\frac{3}{2}xy$

43. $(x^2+2x)\div\frac{1}{4}x$

44. $(4x^2-3xy)\div\frac{1}{2}x$

45. $\frac{12x^2-24xy+9x}{-3x}$

46. $(6ab+2a)\div 2a$

47. $(12xy-9x)\div 3x$

48. $(12xy-6x)\div 3x$

49. $(8a^2-16a)\div(-4a)$

50. $(-4x^2+16x)\div 4x$

51. $(35ab^3+14a^2b^2)\div(-7ab^2)$

52. $(5x^3y^2-8x^2y^2)\div(-3xy)$

53. $(6x^2+8x)\div(-2x)$

54. $(18x^2y-24x)\div 6x$

55. $(12x^2y-8xy^2)\div(-4xy)$

56. $(8x^2y^2+20x)\div 2x$

57. $(5y^2+4y)\div\left(-\frac{y}{2}\right)$

58. $(9a^3b-6ab^2+12a^2b)\div 2ab$

59. $(-10x^3y^2-6x^2y)\div 2x^2y$

60. $(15a^3b^2-6a^2b-3ab)\div 3ab$

61. $(10a^3b^4-8a^2b^2+14ab^2)\div 4ab^2$

62. $(8a^2b^2-6a^2b-10ab^2)\div(-4ab)$

63. $(-14a^3b+21a^2b-7ab^2)\div(-7ab)$

64. $(6x^3y^3-15x^2y^3+9x^2y^2)\div(-3xy^2)$

65. $(a^2b+9ab^2-2ab^3)\div\frac{3}{2}ab$

66. $(6x^2+9xy-15x)\div 3x$

67. $(14a^2b-21a^3b^2)\div(-7a^2b)$

68. $(10x^2y-6xy^2)\div\frac{2}{3}xy$

69. $(9ab^2+12a^2-15a^2b)\div\frac{3}{4}a$

70. $(8a^2b-4ab^2-ab)\div\frac{4}{11}a$

71. $\left(\frac{1}{4}x^2-\frac{1}{8}xy+2x\right)\div\frac{3}{4}x$

72. $\left(5x^2y^2+\frac{2}{5}x^2y+xy^2\right)\div\frac{2}{5}xy$

73. $(12a^2b+8ab)\div\left(-\frac{4}{5}ab\right)$

74. $(14x^2-21xy^2)\div\left(-\frac{7}{2}x\right)$

75. $(-6ab^2+9ab)\div\left(-\frac{3}{4}b\right)$

76. $(2x^3y^3-3x^2y+xy^2)\div\left(-\frac{1}{3}xy\right)$

77. $\left(\frac{4}{9}x^3+6x^2+8x\right)\div\left(-\frac{2}{3}x\right)$

78. $\left(\frac{1}{3}x^2y-\frac{1}{6}xy^2-\frac{1}{9}xy\right)\div\left(-\frac{1}{12}xy\right)$

79. $(9x^4y^3-3x^3y^2-12xy^5)\div\left(-\frac{3}{4}xy\right)$

다항식의 혼합계산

◪ 다음 식을 간단히 하여라.

80. $a(3a-b)-2a(a+3b)$

81. $6a(-2a+3)-7(a^2+a-2)$

82. $4x(-x+2)+3x(x-3)$

83. $x(x-y)+y(x+2y)$

84. $2b(3a-b+2)-b(6a+1)$

85. $2x(3x+y)+4y(2x-5y)$

86. $ab(4a+b)-(3ab-b^2)\times a$

87. $-3a(a-2b+5)+a(-a+4b+6)$

88. $2a(7a+4)-(3a+2)\times(-2a)$

89. $4xy(-x+3y-2)+(2x-1)\times 2xy$

90. $3(a-2b)-(12a^2-15ab)\div 3a$

91. $-2a(b-5)-(-3ab+4a)$

92. $-3x(x-2y)+(x+5y)\times(-2x)$

93. $(6x^3y-8x^2y^2)\div(-2xy)-4x(x-3y)$

94. $(2xy-6y^2)\div(-2y)+(-3x+y)$

95. $(18x^4y^2-9x^2y)\div 3xy$

96. $2(5x+4y)+(8x^2-6xy)\div 2x$

97. $(6x^2+4x)\div(-2x)+(3x-5)\times 3x$

98. $-6a(a+4)-(15a^2-9a)\div(-3a)$

99. $a(a+4)+(a^3b-4a^2b)\div ab$

100. $(16x^2y-8xy^2)\div(-4xy)-(15x^2-6x)\div 3x$

101. $2x(1-4y)+(8x^2y-4x^2)\div 2x$

102. $-a(2a+5)+(a^2-2ab)\div\frac{a}{4}$

103. $(9a^2b-12ab^2)\div 3a-(16a^2b+8ab^2)\div 4a$

104. $(10a^2-6a)\div 2a-(4a^2-7a^2b)\div a$

105. $(-6x^2y+4xy^2)\div(-2xy)^3\times 4x^2y^3$

106. $x^2y-\{(2xy)^2-6x^2y^2\}\div y$

107. $2x(4x-8y)-(8x^2y^2-4x^3y)\div 2xy$

108. $(-6x^2+4x)\div\frac{1}{3}x+(-2x^3-5x)\div\left(-\frac{1}{2}x\right)$

109. $\frac{15x^3y^2+10x^2y^3}{5xy}-2xy(x-y)$

110. $\frac{9a-15a^2}{3a}+\frac{4b^2+16b}{4b}$

111. $-3x(x-4)-(8x^2y+12xy-4y)\div\frac{4}{3}y$

112. $\{2ab(a-3b)-(-3a^2b)^2\div a^2b\}\times 4ab^2$

113. $a(4a-b+5)+\left(\frac{1}{3}a+2b-1\right)\times 3a$

114. $-2a(6a-b+3)-(a^2+a)\times(-8)$

115. $(6x^2y^2-18xy^2)\div 3x-(4y-8xy)\times 2y$

116. $2a(3ab-b+2)-(9a^3b^2+12a^2b)\div 3ab$

117. $(2x^2y-8xy^2)\div\frac{2}{3}xy-(9x^2y-6xy^2)\div\frac{3}{4}xy$

118. $(9x^3y-3xy^2)\div\frac{3}{2}xy+3x(x-5y)$

119. $-3x(x-5)+(6x^2y-8xy)\div\frac{2}{3}y$

120. $(8a^2b-6ab^2+2b)\div(-2b)+(2a^3b^2-3a^2b^3)\div\frac{1}{2}ab^2$

정답 및 해설

1) $-20x^2+16x$

2) $15x^2+10x$

3) $10ab-6a$

4) $3a^2+4a$

5) $6xy-3y$

6) $-4x^2-6x$
⇨ $(2x+3)\times(-2x)$
$=2x\times(-2x)+3\times(-2x)$
$=-4x^2-6x$

7) $3x^2-3xy$
⇨ $(-x+y)\times(-3x)$
$=(-x)\times(-3x)+y\times(-3x)$
$=3x^2-3xy$

8) $6x^2+4xy$

9) $-12a^2+15a$

10) $6x^3y-8x^2y$

11) $4x^3+12x^2-20x$

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

13) $-9a^3b-18a^2b+27ab^3$

14) $-6x^2+4xy+2x$

15) $-5x^2+10xy-30x$

16) $-4x^2+2xy-6x$

17) $-2a^2-ab+4a$

18) $3xy+12y^2-9y$

19) $16a^3b-10ab^2+6ab$

20) $18x^3y-12x^2y^2+30xy^3$

21) $6x^2-10xy+4x$

22) $-3x^2+15xy-3x$

23) $-3a^2+12ab-3a$

24) $10a^2-2ab+14a$

25) $2a^2-3ab+5a$

26) $-\frac{2}{3}ab+2b^2-3b$

27) $8x^2-6xy+4x$

28) $-6x^2+12xy-18x$

29) $15a^2-10ab+15a$

30) $-6a^2-8ab+4a$

31) $3a^2-9ab+12a$
⇨ $(-a+3b-4)\times(-3a)$
$=(-a)\times(-3a)+3b\times(-3a)+(-4)\times(-3a)$
$=3a^2-9ab+12a$

32) $-3x^2+xy-2x$

33) $2x-3$
⇨ (주어진 식)$=\frac{8x^2-12x}{4x}=2x-3$

34) $5b-3$

35) $8x-2$

36) $4x-8y$

37) $x-2y$
⇨ (주어진 식)$=\frac{x^2y-2xy^2}{xy}=x-2y$

38) $-7x+2y$

39) $-5x+2$

40) $-3a^2b+2a$

41) $-2xy-5y^2$

42) $10x-6y$
⇨ (주어진 식)$=(15x^2y-9xy^2)\times\frac{2}{3xy}=10x-6y$

43) $4x+8$
⇨ $(x^2+2x)\div\frac{1}{4}x=(x^2+2x)\times\frac{4}{x}=4x+8$

44) $8x-6y$
⇨ $(4x^2-3xy)\div\frac{1}{2}x=(4x^2-3xy)\times\frac{2}{x}=8x-6y$

45) $-4x+8y-3$

46) $3b+1$

47) $4y-3$

48) $4y-2$

⇨ $(12xy-6x)\div 3x=\frac{12xy}{3x}-\frac{6x}{3x}=4y-2$

49) $-2a+4$

⇨ $(8a^2-16a)\div(-4a)=\frac{8a^2}{-4a}+\frac{-6a}{-4a}=-2a+4$

50) $-x+4$

51) $-5b-2a$

52) $-\frac{5}{3}x^2y+\frac{8}{3}xy$

53) $-3x-4$

⇨ $(6x^2+8x)\div(-2x)$

$=6x^2\times\left(-\frac{1}{2x}\right)+8x\times\left(-\frac{1}{2x}\right)$

$=-3x-4$

54) $3xy-4$

55) $-3x+2y$

⇨ $(12x^2y-8xy^2)\div(-4xy)$

$=12x^2y\times\left(-\frac{1}{4xy}\right)+(-8xy^2)\times\left(-\frac{1}{4xy}\right)=-3x+2y$

56) $4xy^2+10$

57) $-10y-8$

⇨ $(5y^2+4y)\div\left(-\frac{y}{2}\right)$

$=(5y^2+4y)\times\left(-\frac{2}{y}\right)$

$=5y^2\times\left(-\frac{2}{y}\right)+4y\times\left(-\frac{2}{y}\right)$

$=-10y-8$

58) $\frac{9}{2}a^2-3b+6a$

59) $-5xy-3$

60) $5a^2b-2a-1$

61) $\frac{5}{2}a^2b^2-2a+\frac{7}{2}$

62) $-2ab+\frac{3}{2}a+\frac{5}{2}b$

63) $2a^2-3a+b$

64) $-2x^2y+5xy-3x$

65) $\frac{2}{3}a+6b-\frac{4}{3}b^2$

⇨ $(a^2b+9ab^2-2ab^3)\div\frac{3}{2}ab$

$=(a^2b+9ab^2-2ab^3)\times\frac{2}{3ab}$

$=\frac{2}{3}a+6b-\frac{4}{3}b^2$

66) $2x+3y-5$

67) $-2+3ab$

68) $15x-9y$

69) $12b^2+16a-20ab$

⇨ $(9ab^2+12a^2-15a^2b)\div\frac{3}{4}a$

$=(9ab^2+12a^2-15a^2b)\times\frac{4}{3a}$

$=\frac{36ab^2}{3a}+\frac{48a^2}{3a}-\frac{60a^2b}{3a}$

$=12b^2+16a-20ab$

70) $22ab-11b^2-\frac{11}{4}b$

⇨ $(8a^2b-4ab^2-ab)\div\frac{4}{11}a$

$=(8a^2b-4ab^2-ab)\times\frac{11}{4a}$

$=22ab-11b^2-\frac{11}{4}b$

71) $\frac{1}{3}x-\frac{1}{6}y+\frac{8}{3}$

⇨ $\left(\frac{1}{4}x^2-\frac{1}{8}xy+2x\right)\div\frac{3}{4}x$

$=\left(\frac{1}{4}x^2-\frac{1}{8}xy+2x\right)\times\frac{4}{3x}=\frac{1}{3}x-\frac{1}{6}y+\frac{8}{3}$

72) $\frac{25}{2}xy+x+\frac{5}{2}y$

⇨ $\left(5x^2y^2+\frac{2}{5}x^2y+xy^2\right)\div\frac{2}{5}xy$

$=\left(5x^2y^2+\frac{2}{5}x^2y+xy^2\right)\times\frac{5}{2xy}=\frac{25}{2}xy+x+\frac{5}{2}y$

73) $-15a-10$

⇨ $(12a^2b+8ab)\div\left(-\frac{4}{5}ab\right)$

$=(12a^2b+8ab)\times\left(-\frac{5}{4ab}\right)=-15a-10$

74) $-4x+6y^2$

⇨ $(14x^2-21xy^2)\div\left(-\frac{7}{2}x\right)=(14x^2-21xy^2)\times\left(-\frac{2}{7x}\right)$
$=-4x+6y^2$

75) $8ab-12a$

⇨ $(-6ab^2+9ab)\div\left(-\frac{3}{4}b\right)$
$=(-6ab^2+9ab)\times\left(-\frac{4}{3b}\right)=8ab-12a$

76) $-6x^2y^2+9x-3y$

⇨ $(2x^3y^3-3x^2y+xy^2)\div\left(-\frac{1}{3}xy\right)$
$=(2x^3y^3-3x^2y+xy^2)\times\left(-\frac{3}{xy}\right)$
$=-6x^2y^2+9x-3y$

77) $-\frac{2}{3}x^2-9x-12$

⇨ $\left(\frac{4}{9}x^3+6x^2+8x\right)\div\left(-\frac{2}{3}x\right)$
$=\left(\frac{4}{9}x^3+6x^2+8x\right)\times\left(-\frac{3}{2x}\right)$
$=-\frac{2}{3}x^2-9x-12$

78) $-4x+2y+\frac{4}{3}$

⇨ $\left(\frac{1}{3}x^2y-\frac{1}{6}xy^2-\frac{1}{9}xy\right)\div\left(-\frac{1}{12}xy\right)$
$=\left(\frac{1}{3}x^2y-\frac{1}{6}xy^2-\frac{1}{9}xy\right)\times\left(-\frac{12}{xy}\right)$
$=-4x+2y+\frac{4}{3}$

79) $-12x^3y^2+4x^2y+16y^4$

⇨ $(9x^4y^3-3x^3y^2-12xy^5)\div\left(-\frac{3}{4}xy\right)$
$=(9x^4y^3-3x^3y^2-12xy^5)\times\left(-\frac{4}{3xy}\right)$
$=9x^4y^3\times\left(-\frac{4}{3xy}\right)+(-3x^3y^2)\times\left(-\frac{4}{3xy}\right)$
$+(-12xy^5)\times\left(-\frac{4}{3xy}\right)$
$=-12x^3y^2+4x^2y+16y^4$

80) a^2-7ab

⇨ (주어진 식)$=3a^2-ab-2a^2-6ab=a^2-7ab$

81) $-19a^2+11a+14$

⇨ (주어진 식)$=-12a^2+18a-7a^2-7a+14$
$=-19a^2+11a+14$

82) $-x^2-x$

83) x^2+2y^2

⇨ (주어진 식)$=x^2-xy+xy+2y^2=x^2+2y^2$

84) $-2b^2+3b$

⇨ (주어진 식)$=6ab-2b^2+4b-6ab-b=-2b^2+3b$

85) $6x^2+10xy-20y^2$

⇨ (주어진 식)$=6x^2+2xy+8xy-20y^2$
$=6x^2+10xy-20y^2$

86) a^2b+2ab^2

87) $-4a^2+10ab-9a$

⇨ (주어진 식)$=-3a^2+6ab-15a-a^2+4ab+6a$
$=-4a^2+10ab-9a$

88) $20a^2+12a$

⇨ (주어진 식)$=14a^2+8a+6a^2+4a=20a^2+12a$

89) $12xy^2-10xy$

⇨ (주어진 식)$=-4x^2y+12xy^2-8xy+4x^2y-2xy$
$=12xy^2-10xy$

90) $-a-b$

⇨ (주어진 식)$=3a-6b-(4a-5b)$
$=3a-6b-4a+5b=-a-b$

91) $6a+ab$

⇨ $-2a(b-5)-(-3ab+4a)$
$=-2ab+10a+3ab-4a$
$=6a+ab$

92) $-5x^2-4xy$

93) $-7x^2+16xy$

⇨ (주어진 식)$=-3x^2+4xy-4x^2+12xy=-7x^2+16xy$

94) $-4x+4y$

95) $6x^3y-3x$

⇨ $(18x^4y^2-9x^2y)\div 3xy=18x^4y^2\div 3xy-9x^{2y}\div 3xy$
$=6x^3y-3x$

96) $14x+5y$

97) $9x^2-18x-2$

⇨ $(6x^2+4x)\div(-2x)+(3x-5)\times 3x$
$=\frac{6x^2+4x}{-2x}+9x^2-15x$
$=-3x-2+9x^2-15x$
$=9x^2-18x-2$

98) $-6a^2-19a-3$

⇨ $-6a(a+4)-(15a^2-9a)\div(-3a)$
$=-6x^2-24a-(-5a+3)$
$=-6a^2-24a+5a-3$
$=-6a^2-19a-3$

99) $2a^2$

100) $-9x+2y+2$

101) $-4xy$

102) $-2a^2-a-8b$

103) $-ab-6b^2$

⇨ (주어진 식) $=\dfrac{9a^2b-12ab^2}{3a}-\dfrac{16a^2b+8ab^2}{4a}$
$=3ab-4b^2-4ab-2b^2=-ab-6b^2$

104) $a+7ab-3$

105) $3xy-2y^2$

106) $3x^2y$

⇨ $x^2y-\{(2xy)^2-6x^2y^2\}\div y$
$=x^2y-(4x^2y^2-6x^2y^2)\div y$
$=x^2y-(-2x^2y^2)\div y$
$=x^2y+2x^2y$
$=3x^2y$

107) $10x^2-20xy$

⇨ $2x(4x-8y)-(8x^2y^2-4x^3y)\div 2xy$
$=8x^2-16xy-4xy+2x^2=10x^2-20xy$

108) $4x^2-18x+22$

⇨ $(-6x^2+4x)\div\dfrac{1}{3}x+(-2x^3-5x)\div\left(-\dfrac{1}{2}x\right)$
$=(-6x^2+4x)\times\dfrac{3}{x}+(-2x^3-5x)\times\left(-\dfrac{2}{x}\right)$
$=-18x+12+4x^2+10$
$=4x^2-18x+22$

109) x^2y+4xy^2

⇨ (주어진 식)$=3x^2y+2xy^2-2x^2y+2xy^2=x^2y+4xy^2$

110) $-5a+b+7$

⇨ (주어진 식)$=3-5a+b+4=-5a+b+7$

111) $-9x^2+3x+3$

⇨ $-3x(x-4)-(8x^2y+12xy-4y)\div\dfrac{4}{3}y$
$=-3x^2+12x-(8x^2y+12xy-4y)\times\dfrac{3}{4y}$
$=-3x^2+12x-6x^2-9x+3$
$=-9x^2+3x+3$

112) $-28a^3b^3-24a^2b^4$

⇨ $\{2ab(a-3b)-(-3a^2b)^2\div a^2b\}\times 4ab^2$
$=\left\{2a^2b-6ab^2-9a^4b^2\times\dfrac{1}{a^2b}\right\}\times 4ab^2$
$=(2a^2b-6ab^2-9a^2b)\times 4ab^2$
$=(-7a^2b-6ab^2)\times 4ab^2$
$=-28a^3b^3-24a^2b^4$

113) $5a^2+5ab+2a$

⇨ (주어진 식) $=4a^2-ab+5a+a^2+6ab-3a$
$=5a^2+5ab+2a$

114) $-4a^2+2ab+2a$

⇨ (주어진 식) $=-12a^2+2ab-6a+8a^2+8a$
$=-4a^2+2ab+2a$

115) $18xy^2-14y^2$

⇨ (주어진 식) $=2xy^2-6y^2-(8y^2-16xy^2)$
$=2xy^2-6y^2-8y^2+16xy^2$
$=18xy^2-14y^2$

116) $3a^2b-2ab$

⇨ (주어진 식) $=6a^2b-2ab+4a-(3a^2b+4a)$
$=6a^2b-2ab+4a-3a^2b-4a$
$=3a^2b-2ab$

117) $-9x-4y$

⇨ (주어진 식)
$=(2x^2y-8xy^2)\times\dfrac{3}{2xy}-(9x^2y-6xy^2)\times\dfrac{4}{3xy}$
$=3x-12y-(12x-8y)=-9x-4y$

118) $9x^2-15xy-2y$

119) $6x^2+3x$

⇨ $-3x(x-5)+(6x^2y-8xy)\div\dfrac{2}{3}y$
$=-3x^2+15x+(6x^2y-8xy)\times\dfrac{3}{2y}$
$=-3x^2+15x+6x^2y\times\dfrac{3}{2y}-8xy\times\dfrac{3}{2y}$
$=-3x^2+15x+9x^2-12x$
$=6x^2+3x$

120) $-3ab-1$