因式分解

I. Common Factor

Eg. Factorise $9ac + 12ab$

3	9ac 12ab
a	3ac 4ab
	3c 4b

Therefore, $9ac + 12ab = 3a(3c + 4b)$

II. Formulae

$a^2 - b^2 = (a + b)(a - b)$

Eg. $\sqrt{9} = 3 \rightarrow a$

$\sqrt{x^2} = x \rightarrow b$

$9 - x^2 = (3 + x)(3 - x)$

III. Perfect square formulae

$a^2 + 2ab + b^2 = (a + b)^2$
$a^2 - 2ab + b^2 = (a - b)^2$
$a^2 + b^2 + c^2 + 2ab + 2bc + 2ca = (a + b + c)^2$

IV. Perfect cube formulae

$x^3 + 3x^2y + 3xy^2 + y^2 = (x + y)^3$

$x^3 - 3x^2y + 3xy^2 - y^2 = (x - y)^3$

Eg. $x^3 + 6x^2y + 3xy^2 + 8y^3$

$\sqrt[3]{x^3} = x$

$\sqrt[3]{8y^3} = 2y$

$x^3 + 6x^2y + 3xy^2 + 8y^3$=$(x + 2y)^3$

Eg. $27x^3 - 27x^2y + 9xy^2 - y^3$

$\sqrt[3]{27x^3} = 3x$

$\sqrt[3]{y^3} = y$

$$27x^3 - 27x^2y + 9xy^2 - y^3 = (3x - y)^3$$

$$x^3 - y^3 = (x - y)(x^2 + y^2 + xy)$$

$$x^3 + y^3 = (x + y)(x^2 + y^2 - xy)$$

Eg. $8x^3 - y^3$

$\sqrt[3]{8x^3} = 2x$

$\sqrt[3]{y^3} = y$

$8x^3 - y^3 = (2x - y)(\ 4x^2 + y^2 + 2xy)$

V. Cross multiplication

Factorise $x^2 + x - 12 = (x - 3)(x + 4)$

x	-3	$-3x$
x	4	$+4x$
x^2	-12	x

Exercise

Section 1 :Factorization

1. $xz + z^2$
2. $10xy - 5x^2$
3. $x^3y - xy^2$
4. $abc + b^2c$
5. $12a - 14a^3$
6. $121 - y^2$
7. $x^2y^2 - 36y^2$
8. $\frac{a^2}{25} - \frac{4b^2}{9}$
9. $\frac{x^2}{4} - \frac{y^2}{9}$
10. $49x^4y^4 - 25z^4$
11. $x^2 - 2x + 1$
12. $8x^3 + 12x^2y + 16xy^2 + y^3$
13. $x^3 - 27y^3$
14. $x^3 - 9x^2y + 27xy^2 - 27y^3$
15. $125x^3 - 8y^3$
16. $x^2 + 3x + 2$
17. $x^2 + x - 2$
18. $x^2 - 4x + 3$
19. $x^2 + 4x + 3$
20. $y^2 - 4y - 5$
21. $b^2 - 6b - 7$
22. $x^2 - x - 6$
23. $a^2 + 6a + 8$
24. $m^2 + 9m + 8$
25. $m^2 - 7m - 8$
26. $b^2 - 3b - 10$
27. $c^2 - c - 12$
28. $a^2 - 9a + 14$
29. $x^2 + 8x + 12$
30. $p^2 - 8p + 15$
31. $b^2 - 16b + 15$
32. $e^2 - 7e + 12$
33. $a^2 - a - 20$
34. $x^2 - 9x + 18$
35. $x^2 + 4x - 21$
36. $y^2 - 7y - 18$
37. $n^2 - 5n - 24$
38. $m^2 + 11m + 28$
39. $y^2 + 7y + 10$
40. $x^2 - x - 42$
41. $y^2 + 10y + 24$
42. $x^2 + 5x - 36$

43. $p^2 - 14p + 24$
44. $n^2 + 12n + 32$
45. $d^2 + 18d + 45$
46. $2x^2 + 5x + 3$
47. $2x^2 - 7x + 3$
48. $3x^2 + 7x + 2$
49. $3k^2 + k - 2$
50. $2a^2 + a - 1$
51. $3y^2 - 2y - 1$
52. $3m^2 - 5m - 2$
53. $5y^2 - 4y - 1$
54. $5m^2 + 2m - 3$
55. $2a^2 + 11a + 5$
56. $2y^2 + y - 6$
57. $3a^2 - 7a - 6$
58. $2p^2 - 19p + 9$
59. $3m^2 - 2m - 8$
60. $5x^2 - 23x - 10$
61. $3a^2 + 14a + 15$
62. $3y^2 + 10y - 8$
63. $2p^2 + 7p - 15$
64. $5p^2 + 13p + 6$
65. $2x^2 + 11x + 12$