

Work covered in lesson on Thursday 10 April as well as homework for Tuesday 15 April

1. Activity 13

$$\begin{aligned}
 15. \quad x^2a - bx^2 - 9a + 9b &= \dots\dots\dots 4t^3a - 4bt^2 - \frac{1}{4}a + \frac{1}{4}b \\
 &= x^2(a-b) - 9(a-b) &= 4t^3(a-b) - \frac{1}{4}(a-b) \\
 &= (a-b)[x^2 - 9] &= (a-b)\left[4t^3 - \frac{1}{4}\right] \\
 &= (a-b)[x-3][x+3] &= (a-b)\left(2t - \frac{1}{2}\right)\left(2t + \frac{1}{2}\right)
 \end{aligned}$$

Class Test 7 on Products and Factorising (Grouping):

1. Simplify:

$$\begin{aligned}
 a) \quad (x-2)(2x-1) &= 2x^2 - x - 4x + 2 \\
 &= 2x^2 - 5x + 2 \\
 &\quad - [x^3 + 3x^2 + 9x - 3x^2 - 9x - 27] \\
 b) \quad -(3x-4)^2 &= -(3x-4)(3x-4) \\
 &= -[9x^2 - 12x - 12x + 16] \\
 &= -[9x^2 - 24x + 16] \\
 &= -9x^2 + 24x - 16 \\
 c) \quad 27 - (x-3)(x^2 + 3x + 9) &= 27 - [x^3 - 27] \\
 &= 27 - x^3 + 27 \\
 &= -x^3 + 54
 \end{aligned}$$

2. Factorise:

$$\begin{aligned}
 a) \quad 36a^2 - 6a + 7b - 49b^2 &= 36a^2 - 49b^2 - 6a + 7b \\
 &= (6a-7b)(6a+7b) - (6a-7b) \\
 &= (6a-7b)((6a+7b) - 1) \\
 &= (6a-7b)(6a+7b-1) \\
 b) \quad 25x^2a - 25bx^2 - a + b &= 25x^2(a-b) - 1(a-b) \\
 &= (a-b)[25x^2 - 1] \\
 &= (a-b)[5x-1][5x+1] \\
 c) \quad x^2 - 16x + 64 &= (x-8)(x-8) \\
 &= (x-8)^2 \\
 d) \quad x^2 - 16x + 64 - y^2 &= (x-8)^2 - y^2 \\
 &= (x-8-y)(x-8+y)
 \end{aligned}$$

ACTIVITY 14. Grouping (3 + 1):

How to recognize "3 + 1" grouping: Trinomial (which is a perfect square) and Perfect square separated by "-".

Factorise the following:

$$\begin{aligned}
 a) \quad x^2 - 2x + 1 - y^2 &= (x-1)^2 - y^2 \\
 &= (x-1-y)(x-1+y) \\
 b) \quad 9x^2 - 6x + 1 - y^2 &= (3x-1)^2 - y^2 \\
 &= (3x-1-y)(3x-1+y) \\
 c) \quad x^2 - 4x + 4 - 9y^2 &= (x-2)^2 - 9y^2 \\
 &= (x-2-3y)(x-2+3y) \\
 d) \quad 25x^2 - 10x + 1 - 16y^2 &= (5x-2)^2 - 16y^2 \\
 &= (5x-2-4y)(5x-2+4y) \\
 e) \quad x^2 - 8x + 16 - 4y^2 &= (x-4)^2 - 4y^2 \\
 &= (x-4-2y)(x-4+2y) \\
 f) \quad x^2 - 16y^2 - 10x + 25 &= x^2 - 10x + 25 - 16y^2 \\
 &= (x-5)^2 - 16y^2 \\
 &= (x-5-4y)(x-5+4y) \\
 g) \quad x^2 - y^2 - 14x + 49 &= x^2 - 14x + 49 - y^2 \\
 &= (x-7)^2 - y^2 \\
 &= (x-7-y)(x-7+y) \\
 h) \quad 49x^2 - 100y^2 - 14x + 1 &= 49x^2 - 14x + 1 - 100y^2 \\
 &= (7x-1)^2 - 100y^2 \\
 &= (7x-1-10y)(7x-1+10y)
 \end{aligned}$$

Class Test 8 on Products and Factorising (All Grouping):

1. Simplify:

a) $(x - 3)(3x - 1) = 3x^2 - 10x + 3$

b) $-(5x + 2)^2 = -(25x^2 + 20x + 4) = -25x^2 - 20x - 4$

c) $1 - (x+1)(x^2 - x + 1) = 1 - (x^3 - x^2 + x + x^2 - x + 1) = 1 - x^3 + x^2 - x - x^2 + x - 1 = -x^3$

2. Factorise

a) $3x - 3y - qx + qy = 3(x - y) - q(x - y) = (x - y)(3 - q)$

b) $49a^2 - 7a + 6b - 36b^2 = 49a^2 - 36b^2 - 7a + 6b = (7a - 6b)(7a + 6b) - (7a - 6b) = (7a - 6b)(7a + 6b - 1)$

c) $100x^2a - 100bx^2 - a + b = 100x^2(a - b) - (a - b) = (a - b)(100x^2 - 1) = (a - b)(10x - 1)(10x + 1)$

d) $x^3 - x + y - y^3 = x^3 - y^3 - x + y = (x - y)(x^2 + xy + y^2) - (x - y) = (x - y)(x^2 + xy + y^2 - 1)$

e) $x^2 - y^2 - 14x + 49 = [3 \text{ and } 1 \text{ not } 2 \text{ and } 2] = x^2 - 14x + 49 - y^2 = (x - 7)(x - 7) - y^2 = (x - 7)^2 - y^2 = (x - 7 - y)(x - 7 + y)$