National 5 Mathematics

Algebraic Operations – Solutions

Marks are indicated in brackets after each question number

2014 Paper 1 Question 2, (2)

$(2x-5)(3x+1) = 6x^2 - 15x + 2x - 5$

$= 6x^2 - 13x - 5$

2015 Paper 1 Question 4, (3)

$(x-4)(x^2+x-2)$

$= x^3 + x^2 - 2x - 4x^2 - 4x + 8$

$= x^3 - 3x^2 - 6x + 8$

2016 Paper 2 Question 4, (2)

$3x^2 - 48$

$= 3(x^2 - 16)$

$= 3(x-4)(x+4)$

2017 Paper 1 Question 4, (3)

$(2x+3)(x^2-4x+1)$

$= 2x^3 - 8x^2 + 2x + 3x^2 - 12x + 3$

$= 2x^3 - 5x^2 - 10x + 3$

2017 Paper 1 Question 8, (1) (3)

a) $4x^2 - 25 = (2x)^2 - 5^2$

$= (2x-5)(2x+5)$

b) $\frac{4x^2-25}{2x^2-x-10} = \frac{(2x-5)(2x+5)}{(2x-5)(x+2)}$

$= \frac{2x+5}{x+2}$

2018 Paper 1 Question 2, (3)

$(3x + 1)(x - 1) + 2(x^2 - 5)$

$= 3x^2 + x - 3x - 1 + 2x^2 - 10$

$= 5x^2 - 2x - 11$

2019 Paper 1 Question 3, (3)

$(x + 5)(2x^2 - 7x - 3)$

$= 2x^3 - 7x^2 - 3x + 10x^2 - 35x - 15$

$= 2x^3 + 3x^2 - 38x - 15$

2022 Paper 2 Question 1, (3)

$(3x - 2)(2x^2 + 5x - 1)$

$= 6x^3 + 15x^2 - 3x - 4x^2 - 10x + 2$

$= 6x^3 + 11x^2 - 13x + 2$

2023 Paper 1 Question 2, (3)

$(x + 7)^2 + 6(x^2 - 10)$

$= (x + 7)(x + 7) + 6(x^2 - 10)$

$= x^2 + 7x + 7x + 49 + 6x^2 - 60$

$= 7x^2 + 14x - 11$