FEUILLE de DEVELOPPEMENT ET FACTORISATION (niveau 3ème)
Correction

Exercice 1 : Développer et réduire :

a) $A = -3(x-2)$
   $= -3x + 6$

a) $A = -5(3-x)$
   $= -15 + 5x$

b) $B = (b-7)^2 = b^2 - 14b + 49$

b) $B = (b-4)^2 = b^2 - 8b + 16$

c) $C = (2t+3)^2 = 4t^2 + 12t + 9$

c) $C = (4t+5)^2 = 16t^2 + 40t + 25$

d) $D = (x+2)(x-2) = x^2 - 4$

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

e) $E = (5x-7)(5x+7) = (5x)^2 - 7^2 = 25x^2 - 49$

e) $E = (5x-7)(5x+7) = (5x)^2 - 7^2 = 25x^2 - 49$

f) $F = -4y(-5+8y)$
   $= 20y - 32y^2$

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   $= 20y - 32y^2$

g) $G = (2a-2)(3a+3)$
   $= 6a^2 + 6a - 6a - 6$
   $= 6a^2 - 6$

g) $G = (4a+1)(2a-3)$
   $= 8a^2 - 12a + 2a - 3$
   $= 8a^2 - 10a - 3$

Exercice 2 : Factoriser :

A = $4x - 16 = 4(x-4)$

B = $5x^2 + 4x = x(5x+4)$

C = $9x + 9 = 9(x+1)$

D = $25x - 40 = 5(5x-8)$

E = $(x+2)(3x-1) + (x+2)(x-2) = (x+2)[(3x-1)+(x-2)] = (x+2)(4x-3)$

F = $(x-1)(7x+3) - (x-1)(3x+5) = (x-1)[(7x+3)-(3x+5)] = (x-1)[7x+3-3x-5] = (x-1)(4x-2)$

G = $(x+3)^2 - (x+3)(x+2) = (x+3)[(x+3)-(x+2)] = (x+3)[x+3-x-2] = (x+3)$

H = $(x+7)(2x-8) + (x+7) = (x+7)(2x-8) + (x+7) \times 1 = (x+7)[(2x-8)+1] = (x+7)(2x-7)$

A = $3x - 18 = 3(x-6)$

B = $7x^2 + 5x = x(7x+5)$

C = $8x + 8 = 8(x+1)$

D = $16x - 36 = 4(4x-9)$

E = $(x+2)(3x-1) + (x+2)(x-2) = (x+2)[(3x-1)+(x-2)] = (x+2)(4x-3)$

F = $(x-1)(7x+3) - (x-1)(3x+5) = (x-1)[(7x+3)-(3x+5)] = (x-1)[7x+3-3x-5] = (x-1)(4x-2)$

G = $(x+3)^2 - (x+3)(x+2) = (x+3)[(x+3)-(x+2)] = (x+3)[x+3-x-2] = (x+3)$

H = $(x+7)(2x-8) + (x+7) = (x+7)(2x-8) + (x+7) \times 1 = (x+7)[(2x-8)+1] = (x+7)(2x-7)$

Exercice 3 :

1. Développer et réduire les expressions suivantes.

a) $(x+7)^2 = x^2 + 14x + 49$

b) $(2x-8)^2 = (2x)^2 - 2 \times 2x \times 8 + 64$
$= 4x^2 - 32x + 64$

c) $(5a-1)(3a+3)$
$= 15a^2 + 15a - 3a - 3$
$= 15a^2 + 12a - 3$

d) $2(x+4) - (x+3)(2x-1)$
$= 2x + 8 - \left(2x^2 - x + 6x - 3\right)$
$= 2x + 8 - 2x^2 + x - 6x + 3$
$= -2x^2 - 3x + 11$

2. Factoriser les expressions suivantes.

a) $27x + 27 = 27(x+1)$

b) $x^2 - 12x + 36 = (x-6)^2$

c) $(x+1)(2x+4) - (x-7)(x+1)$
$= (x+1)\left[(2x+4) - (x-7)\right]$
$= (x+1)\left[2x+4-x+7\right]$
$= (x+1)(x+11)$

d) $7(2-x)(13-4x) - (13-4x)^2$
$= 7(2-x)(13-4x) - (13-4x)(13-4x)$
$= (13-4x)\left[7(2-x) - (13-4x)\right]$
$= (13-4x)\left[14 - 7x - 13 + 4x\right]$
$= (13-4x)(-3x+1)$

e) $x^2 - 144 = (x+12)(x-12)$

Exercice 4 :

$D = \dfrac{1}{9} - \dfrac{15}{9} \times \dfrac{1}{6}$

$D = \dfrac{1}{9} - \dfrac{3 \times 5}{3 \times 3 \times 6}$

$D = \dfrac{1}{9} - \dfrac{5}{18}$

$D = \dfrac{1 \times 2}{9 \times 2} - \dfrac{5}{18}$

$D = \dfrac{2}{18} - \dfrac{5}{18}$

$D = -\dfrac{3}{18}$

$\boxed{D = -\dfrac{1}{6}}$

$E = \dfrac{\dfrac{1}{2}}{\dfrac{-3}{4} + 1}$

$E = \dfrac{\dfrac{1}{2}}{\dfrac{-3}{4} + \dfrac{4}{4}}$

$E = \dfrac{\dfrac{1}{2}}{\dfrac{1}{4}}$

$E = \dfrac{1}{2} \times \dfrac{4}{1}$

$E = \dfrac{4}{2}$

$\boxed{E = 2}$