AP4   Factorisation.
Factur commun.

Ex1) $\boxed{ka + kb = k(a+b)}$

1) a) $4x + xy = \boxed{x(4+y)}$

b) $4(x+2) + (x+2)(1-3x) = (x+2)(4+1-3x)$
$= \boxed{(x+2)(5-3x)}$

c) $7(x+4) + (x+4)(1-2x) = (x+4)(7+1-2x)$
$= \boxed{(x+4)(8-2x)}$

2) a) $x^2 + xy = \boxed{x(x+y)}$

b) $(x+3)^2 + (x+3)(1-x) = (x+3)(x+3+1-x)$
$= (x+3)(4) = \boxed{4(x+3)}$

c) $(2-x)^2 + (2-x)(1+3x) = (2-x)(2-x+1+3x)$
$= \boxed{(2-x)(3+2x)}$

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

b) $2(x-4)(1+x) + 3(x-4) = (x-4)(2(1+x)+3)$
$= (x-4)(2+2x+3)$
$= \boxed{(x-4)(5+2x)}$

c) $5(x-2)(1-x) + 8(x-2) = (x-2)(5(1-x)+8)$
$= (x-2)(5-5x+8)$
$= \boxed{(x-2)(13-5x)}$

d) $8x(x-1) + 5(x-1) = \boxed{(x-1)(8x+5)}$

4) a) $3x^2 + 5x = \boxed{x(3x+5)}$

b) $3(1+x)^2 + 5(1+x) = (1+x)(3(1+x)+5) = \boxed{(1+x)(8+3x)}$

c) $-2(x-4)^2 + 3(x-4) = (x-4)(-2(x-4)+3)$
$= (x-4)(-2x+8+3) = \boxed{(x-4)(-2x+11)}$

5) a) $xy + x = \boxed{x(y+1)}$

b) $(x-2)(1+x) + (x-2) = (x-2)(1+x+1) = \boxed{(x-2)(2+x)}$

c) $5x(1-x) + (1-x) = \boxed{(1-x)(5x+1)}$

Ex2) $\boxed{ka - kb = k(a-b)}$

1) a) $5x - xy = \boxed{x(5-y)}$

b) $3(x+2) - (x+2)(1-x) = (x+2)(3-(1-x))$
$= (x+2)(3-1+x)$
$= (x+2)(2+x) = \boxed{(x+2)^2}$

c) $4(x+3) - (x+3)(1-2x) = (x+3)(4-(1-2x))$
$= (x+3)(4-1+2x)$
$= \boxed{(x+3)(3+2x)}$

2) a) $x^2 - xy = \boxed{x(x-y)}$

b) $(x-3)^2 - (x-3)(1-x) = (x-3)(x-3-(1-x))$
$= (x-3)(x-3-1+x)$
$= \boxed{(x-3)(2x-4)}$

c) $(2-x)^2 - (2-x)(1+x) = (2-x)(2-x-(1+x))$
$= (2-x)(2-x-1-x)$
$= \boxed{(2-x)(1-2x)}$

3) a) $3xy - 5x = \boxed{x(3y-5)}$

b) $2(x+4)(1-x) - 2(x+4) = (x+4)(2(1-x)-2)$
$= (x+4)(2-2x-2)$
$= (x+4)(-2x)$
$= \boxed{-2x(x+4)}$

c) $3(x-2)(1-x) - 4(x-2) = (x-2)(3(1-x)-4)$
$= (x-2)(3-3x-4)$
$= \boxed{(x-2)(-1-3x)}$

d) $-3x(x-1) - 2(x-1) = \boxed{(x-1)(-3x-2)}$

4) a) $5x^2 - 3x = \boxed{x(5x-3)}$

b) $3(1+x)^2 - 2(1+x) = (1+x)(3(1+x)-2)$
$= (1+x)(3+3x-2) = \boxed{(1+x)(1+3x)}$

c) $-3(x-4)^2 - 2(x-4) = (x-4)(-3(x-4)-2)$
$= (x-4)(-3x+12-2)$
$= \boxed{(x-4)(-3x+10)}$

5) a) $xy - x = x(y-1)$

b) $(x-2)(1-2x) - (x-2) = (x-2)(1-2x-1)$
$$= (x-2)(-2x)$$
$$= \boxed{-2x(x-2)}$$

c) $x(1-x) - (1-x) = (1-x)(x-1)$
$$= -(x-1)(x-1)$$
$$= \boxed{-(x-1)^2}$$