Simplify the following expressions, putting them in standard form. Show at least one intermediate step for each.

1 $5(k+3)-8k$

To multiply $k+3$ by 5, I multiply each term by 5 (which I do by multiplying each coefficient by 5).

$$5(k+3)-8k = 5\cdot 1k + 5\cdot 3 - 8k = 5k+15-8k.$$

Now I have two k-terms, so I combine them by adding the coefficients:

$$5k+15-8k = (5-8)k+15 = -3k+15.$$

2 $(3x-10)-(4x+6)$

To subtract these polynomials, I first multiply each term in the second polynomial by -1, then combine like terms:

$$(3x-10)-(4x+6) = 3x-10-4x-6 = (3-4)x+(-10-6) = -1x+(-16) = -x-16.$$

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

To subtract these polynomials, I again multiply each term in the second polynomial by -1, then combine like terms:

$$(y^3-2y+1)-(-3y^3+y+5) = y^3-2y+1+3y^3-y-5 = (1+3)y^3+(-2-1)y+(1-5) = 4y^3-3y-4.$$