Elementary Algebra
Skill-Builder # PF – 1C
Factoring out the GCF III

We consider the notion of **opposites** in the following examples.

Examples Factor the following.

1. $x(a-3)+4(3-a)$

Solution: Note that $a-3$ and $3-a$ are not the same since subtraction is not commutative. They are, however, **opposites** of each other, i.e.

$$a-3=-(3-a)$$
$$\text{or, } 3-a=-(a-3).$$

If we use the second relationship, we can rewrite the problem as

$$x(a-3)-4(a-3)$$

and we have the situation we encountered in the previous skill-builder where the GCF is the binomial $a-3$. Factoring out this GCF, we get the factored form of the problem:

$$(a-3)(x-4).$$

2. $8a(x-4y)-10b(4y-x)$

Solution: Again, note that $x-4y$ and $4y-x$ are opposites of each other. Let's use the relationship $4y-x=-(x-4y)$ to rewrite the problem as

$$8a(x-4y)+10b(x-4y).$$

Factoring out the GCF $x-4y$, we get

$$(8a+10b)(x-4y).$$

We note that we can further factor out the GCF 2 from the factor $8a+10b$, and thus we get the complete factored form

$$2(4a+5b)(x-4y).$$

Elementary Algebra
Skill-Builder # PF – 1C
Factoring out the GCF III

Factor completely:

1. $x(a-b)+y(b-a)$	**2.** $3y(x-6)-5w(6-x)$
3. $4n(3y-5x)-9m(5x-3y)$	**4.** $2a(7b-c)+3(c-7b)$
5. $12(3x-10)+4y(10-3x)$	**6.** $15n(4p-5q)-10(5q-4p)$
7. $12a^2(3y-21)-28ab(21-3y)$	**8.** $-8ab^3(9x-6y)+12a^2b^2(6y-9x)$

Elementary Algebra
Skill-Builder # PF – 1C
Factoring out the GCF III

Answers

1. $(x-y)(a-b)$	**2.** $(x-6)(3y+5w)$
3. $(3y-5x)(4n+9m)$	**4.** $(2a-3)(7b-c)$
5. $4(3-y)(3x-10)$	**6.** $5(3n+2)(4p-5q)$
7. $12a(y-7)(3a+7b)$	**8.** $12ab^2(2b+3a)(2y-3x)$

Prepared by: Teresa V. Sutcliffe, Fall 2012