Lesson Plan

Grade 10 Academic Math **Lesson: 7**

- **Unit: Polynomials** **Topic: Factoring Special Quadratics**

- ***homework check:*** **Principles of Mathematics 10 p. 223 # 5 – 7, 9, 11, 12, 15, 17**

- ***note:*** **Factoring Special Quadratics**

Some quadratics are special because the factors that produce them are special. A quadratic that is missing its middle term because the value of B is zero is called a 'difference of squares'. The factors from a difference of squares share terms, but are different because the operation in the brackets is different. So $(a+b)(a-b)=a^2-b^2$. The factors from a sum of squares or perfect square trinomial are exactly the same. We can recognize a perfect square trinomial by seeing if the middle term is twice the roots of the first and last term, so $(a+b)^2=(a+b)(a+b)=a^2+2ab+b^2$.

Factoring involves a lot of recognition of patterns and the relation between terms. Some special quadratics are easier to recognize than others like a difference of squares polynomial. Sum of squares polynomials are not as easy to recognize. For example, identify each of the following as a difference of squares, a sum of squares, or neither. Be sure to include why that quadratic does fit or does not fit into the category.

a) $9x^2-121$

difference of squares because the first and last terms are perfect squares

and they are separated by a minus sign

b) $64a^2+81b^2$

neither because although both terms are perfects squares

they are not separated by a minus sign

c) $9a^2-24ab+16b^2$

sum of squares because both the first and last terms are perfect squares

and the middle term is twice the square root of both

d) $81x^4-72x^2y^3-4y^6$

although both the first and last terms are perfect squares

and the middle term is twice the square root of both

the last term is negative and must be positive

Factor each of the following,

a) $9a^2 - 121 =$

*recognize difference of squares because polynomial

$=(3a)^2 - 11^2$

$=(3a+11)(3a-11)$

b) $64x^4 - 81y^8 =$

recognize difference of squares because

$=(8x^2)^2 - (9y^4)^2$

$=(8x^2 - 9y^4)(8x^2 + 9y^4)$

c) $4a^2 - 12ab + 9b^2 =$

sum of squares because

$=(2a)^2 - 2(2a)(3b) + (3b)^2$

$=(2a-3b)(2a-3b)$

$=(2a-3b)^2$

d) $81x^2 + 216xy + 144y^2$

recognize sum of squares because

$=(9x)^2 + 2(9x)(12y) + (12y)^2$

$=(9x+12y)(9x+12y)$

$=(9x+12y)^2$

- ***homework assignment:*** **<u>Principles of Mathematics 10</u> p. 230 # 5 – 12**