**Secondary Math 2 6.5 Notes Factoring Special Cases**

**Objectives**:

* Students will be able to factor and quadratic trinomial

**Vocabulary**:

1. Conjugate Pair and Difference of Squares:

$$\left(a+b\right)\left(a-b\right)$$

$$=a^{2}-ab+ab-b^{2}$$

$$=a^{2}-b^{2}$$

1. Perfect Square Trinomial

$$a^{2}+2ab+b^{2}=\left(a+b\right)\left(a+b\right)=\left(a+b\right)^{2}$$

$$a^{2}-2ab+b^{2}=\left(a-b\right)\left(a-b\right)=\left(a-b\right)^{2}$$

**Distribution:**

|  |  |
| --- | --- |
| 1. $(5y+9)(5y-9)$

$$=25y^{2}-81$$ | 1. $\left(x+3\right)^{2}$

$$=x^{2}+6x+9$$ |

**Example Set 1:** Factor each difference of square.

|  |  |
| --- | --- |
| 1. $25y^{2}-81$

$$=\left(5y\right)^{2}-9^{2}$$$$=(5y+9)(5y-9)$$ | 1. $u^{7}-100u$

$$u\left(u^{6}-100\right)$$$$u\left(u^{3}\right)^{2}-10^{2}$$$$=\left(u^{3}+10\right)\left(u^{3}-10\right)$$ |

**Example Set 2:** Factor each perfect square trinomial.

|  |  |
| --- | --- |
| 1. $x^{2}+6x+9$

$$=x^{2}+3x+3x+3^{2}$$$$=\left(x+3\right)\left(x+3\right)$$$$=\left(x+3\right)^{2}$$ | 1. $9x^{2}-12x+4$

$$=\left(3x-2\right)^{2}$$ |

**Example Set 3:** Factor each expression

|  |  |
| --- | --- |
| 1. $x^{4}-16$

$$=\left(x^{2}\right)^{2}-4^{2}$$$$=(x^{2}+4)(x^{2}-4)$$$$=(x^{2}+4)(x+2)(x-2)$$ | 1. $x^{4}+12x^{2}+27$

$$=x^{4}+3x^{2}+9x^{2}+3∙9$$$$=x^{2}\left(x^{2}+3\right)+9\left(x^{2}+3\right)$$$$=(x^{2}+9)\left(x^{2}+3\right)$$ |