

Factoring Review

Factoring a Polynomial

Common Factor

Binomial

Difference of Squares

$$81x^2 - 16$$

$$(9x-4)(9x+4)$$

$-36x$

$+36x$

$$(-b)(a+b)$$

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

$$= a^2 - b^2$$

Simple

$$3z^2 - 48z + 165$$

$$= 3(z^2 - 16z + 55)$$

$$-5 \cdot -11 = 55$$

$$-5 + -11 = -16$$

$$= 3(z-5)(z-11)$$

Trinomial

Complex

$$12p^2 + 17p - 5$$

-60

$$-3 \cdot 20 = -60$$

$$-3 + 20 = 17$$

$$= (12p^2 - 3p) + (20p - 5)$$

$$= 3p(4p-1) + 5(4p-1)$$

$$= (4p-1)(3p+5)$$

Perfect Square

$$4t^2 - 20t + 25$$

100

$$-10 \cdot -10 = 100$$

$$-10 + -10 = -20$$

as soon as we see they are the same... we know it is a perfect trinomial \square

$$= (4t^2 - 10t) + (-10t + 25)$$

$$= 2t(2t-5) - 5(2t-5)$$

$$= (2t-5)(2t-5)$$

$$= (2t-5)^2$$

Two variables

$$32x^4 - 162y^8$$

$$2(16x^4 - 81y^8)$$

$$2(\underline{4x^2 - 9y^4})(4x^2 + 9y^4)$$

$$= 2(2x - 3y^2)(2x + 3y^2)(4x^2 + 9y^4)$$

$$\underline{-13} \cdot \underline{3} = -39$$

$$\underline{-13} + \underline{3} = -10$$

$$= (x - 13y)(x + 3y)$$

$$x^2 - 10xy - 39y^2$$

$$12m^2 + 2mn - 70n^2$$

$$= 2(\underline{6m^2 + mn - 35n^2})$$

$$-210$$

$$\underline{-14} \cdot \underline{15} = -210$$

$$\underline{-14} + \underline{15} = 1$$

$$= 2[(6m^2 + 15mn) + (-14mn - 35n^2)]$$

$$= 2[\underline{3m}(2m + 5n) - \underline{7n}(2m + 5n)]$$

$$= 2(3m - 7n)(2m + 5n)$$

$$\underline{1764}$$

$$49r^2 + 84rs + 36s^2$$

$$\underline{42} \cdot \underline{42} = 1764$$

$$\underline{42} + \underline{42} = 84$$

$$= (7r + 6s)(7r + 6s)$$

$$= (7r + 6s)^2$$