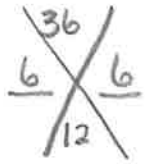
Algebra 1 Name:_____

7.5 Notes

Factoring Special Products

Perfect Square Trinomials:

1.) $x^2 + 12x + 36$

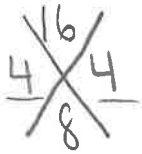


$x^2+6x+6x+36$

$x(x+6)+6(x+6)$

$(x+6)(x+6)$ OR $(x+6)^2$

2.) $x^2 + 8x + 16$

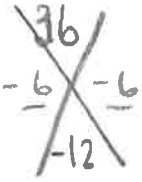


$x^2+4x+4x+16$

$x(x+4)+4(x+4)$

$(x+4)(x+4)$ OR $(x+4)^2$

3.) $4x^2 - 12x + 9$

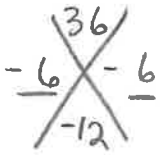


$4x^2-6x-6x+9$

$2x(2x-3)-3(2x-3)$

$(2x-3)(2x-3)$ OR $(2x-3)^2$

4.) $9x^2 - 12x + 4$

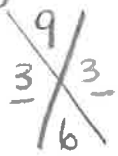


$9x^2-6x-6x+4$

$3x(3x-2)-2(3x-2)$

$(3x-2)(3x-2)$ OR $(3x-2)^2$

5.) $x^2 + 6x + 9$

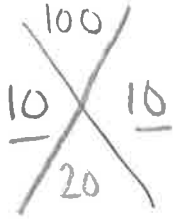


$x^2+3x+3x+9$

$x(x+3)+3(x+3)$

$(x+3)(x+3)$ OR $(x+3)^2$

6.) $4x^2 + 20x + 25$



$4x^2+10x+10x+25$

$2x(2x+5)+5(2x+5)$

$(2x+5)(2x+5)$ OR $(2x+5)^2$

Try it!

7.) $x^2 + 14x + 49$

$(x+7)^2$

8.) $4x^2 - 4x + 1$

$(2x-1)^2$

perfect squares 1, 4, 9, 16, 25, 36, 49, 64, 81, 100...

Difference of two squares:

$$a^2 - b^2$$

$$(\underline{a} + \underline{b})(\underline{a} - \underline{b})$$

what squared gives you each term?

1.) $x^2 - 4$ (x, 2)

$(x+2)(x-2)$

2.) $x^2 - 16$ (x, 4)

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

3.) $49 - p^2$ (7, p) don't flip the order!

$(7+p)(7-p)$

4.) $25m^2 - 81$ (5m, 9)

$(5m+9)(5m-9)$

5.) $16n^2 - 9$ (4n, 3)

$(4n+3)(4n-3)$

6.) $x^4 - 49$ (x^2, 7)

$(x^2+7)(x^2-7)$

x^8-49

$(x^4+7)(x^4-7)$

x^6-49

$(x^3+7)(x^3-7)$

*with a variable, you divide the exponent in half

Try it!

7.) $n^2 - 25$

$(n+5)(n-5)$

8.) $4m^2 - 25$

$(2m+5)(2m-5)$

9.) $k^4 - 36$

$(k^2+6)(k^2-6)$

10.) $9n^2 - 1$

$(3n+1)(3n-1)$

*this only works with subtraction → x^2+16 is "not factorable"

Factor completely. **Note You may need to factor the GCF first.**

1.) $2x^2 - 18$

$2(x^2-9)$

$2(x+3)(x-3)$

2.) $4a^2 - 100$

$4(a^2-25)$

$4(a+5)(a-5)$

3.) $32 - 2y^2$

$2(16-y^2)$

$2(4+y)(4-y)$

Try it!

4.) $9x^2 - 36y^2$

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

$9(x+2y)(x-2y)$

5.) $25a^2 + 100$

$25(a^2+4)$

Can't factor any further

6.) $27x^3 - 3x$

$3x(9x^2-1)$

$3x(3x+1)(3x-1)$